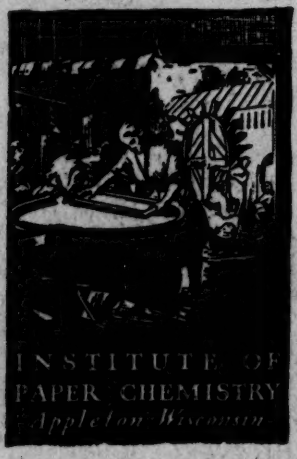
Pages 861-950

BULLETIN

OF

THE INSTITUTE OF PAPER CHEMISTRY



AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

LIBRARY NOTES

AUGUST · 1953

Volume 23 Number 12

THE cut on the cover is a reproduction of the Bookplate of The Institute of Paper Chemistry. The drawing, entitled, "the Papermaker," first appeared in 1698 in the Book of Trade by Christoff Weigel. This particular reproduction has been copied from an illustration appearing on page 43 of Dard Hunter's book "Papermaking Through Eighteen Centuries," published in New York in 1930 by William Edwin Rudge. THE INSTITUTE is greatly indebted to Mr. Hunter for permission to use the illustration.

AUTHOR INDEX TO BOOKS

Biological Stain Commission 862
Bush, G. P., ed. 862
Conn, H. J. 862
Darrow, M. A. 862
Esau, K. 861
Everhart, W. H. 861
Food and Agriculture Organization of the United Nations 862
Gallo, A. 861
Great Britain. *Department of Scientific and Industrial Research. Water Pollution Research Board* 862
Gurney, R. W. 861
Hattery, L. H., ed. 862
Rounsefell, G. A. 861
Sacks, J. 861
Special Libraries Association. *Public Relations Committee* 861
Stotz, E. H. 862
Tindale, H. R. 861
Tindale, T. K. 861
United Nations. *Economic and Social Council. Economic Commission for Latin America* 861
Wagner, R. B. 861
Zook, H. D. 861

AUTHOR INDEX TO ABSTRACTS

The letter P preceding a page number indicates a patent abstract

Adams, D. S. 915
Adams, G. A. 875
Advertising Age 863
Ahlmeyer, H. ..... P 935
Alford Cartons ..... P 944
Alhojärvi, J. 912
American Association of Textile Chemists and Colorists. *Research Committee on Fastness to Light* .. 906
American Newspaper Publishers Association 895
American Newspaper Publishers Association. *Research Department* .. 911
American Oil Chemists' Society. *Cellulose Yield Committee* 878
Andersson, O. 898
Anker, C. A. ..... P 933
Anyas-Weisz, L. 920
Arden Farms Co. ..... P 936
Aries, R. S. ..... P 927
Arkell and Smiths ..... P 930
Armour and Company ..... P 932, P 945
Arnold, G. 906
Atkin, W. C. 916
Atkinson, R. L. ..... P 945
Atwood, R. H. 903
Back, E. 909
Backhouse, H. T. ..... P 943
Bahlsen, W. ..... P 947
Baker, T. R. ..... P 935
Baker Brush Company 896
Balcom, J. G. 904
Ballun, A. T. 921
Barrett, B. J. 875
Bartelt, H. L. ..... P 945
Baynes, W. C. ..... P 946
Becher, J. J. 925
Becker, M. 877
Beckman, N. J. 907
Bell, A. E. ..... P 939
Belser, R. B. 921
Belsinger, J. R. ..... P 947
Belsinger, Inc. ..... P 947
Bemiss-Jason Machine Co. ..... P 935
Bennett, G. R. 909
Berch, S. H. ..... P 936
Beretvas, H. S. ..... P 948
Berthier, R. 864
Besley, L. 883
Bhargava, K. D. 891, 898
Bhat, R. V. 884, 885
Bishop, C. T. 875
The Black-Clawson Company ..... P 942
Blanchette, H. ..... P 940
Boadway, J. D. 878
Bolding, H. V. ..... P 932
Bonini, J. H. 883
The Borden Company ..... P 927
Böttger, H. 873
Bottle, R. T. 916
Bowden, H. 872
Bradley, H. ..... P 932
The Bradley & Gilbert Company ... P 932
Brasch, L. W. 878
Breyfogle, H. 890
Brink, E. H. ..... P 928
Brissaud, L. 924
British Paper and Board Makers' Association. *Technical Section* 866
Broeren, F. L. ..... P 931
Brook, L. ..... P 940
Brookes, J. D. 883
Brown, J. L. 865
Brown, W. G. E. 884
Bryce, P. B. 890
Buell, H. W. ..... P 946
Bureau, W. H. 911
Burns, I. G. 867
Burroughs, E. E. ..... P 936
Butterworth, C. E. 920
Cadillac Products, Inc. ..... P 945
Cambridge Corporation 864
Campbell, S. J. ..... P 940
Canadian Gypsum Company Limited P 929
Canadian Pulp and Paper Association. *Technical Section. Engineering Data Sheet Committee* 914, 920, 922
Canfield, C. 898
The Carborundum Company ..... P 946
Carpenter, H. L. ..... P 947
Carpenter Container Corporation ... P 948
Celanese Corporation of America .. .. P 933, P 947
La Cellophane ..... P 936
Chalmers, G. J. 891
Chapman, R. ..... P 942
Chapman Forest Utilization, Inc. .. .. P 928, P 942
Charlesworth, M. J. 879
Chattaway, M. M. 923
Chemical Engineering 878
Chittick, C. Y. ..... P 928
Ciba Limited ..... P 930
Clapper, F. R. 911
Clark, C. L. ..... P 931
Cloud, W. S. ..... P 940
Coghill, J. T. ..... P 931, P 938
Cohen, W. E. 881
Cole, E. J. 894
Colvin, J. J. ..... P 943
Conkey, J. H. 880
Conover, J. H. ..... P 929
Container Corporation of America ... P 931
Corte, H. 870
Craig, J. B. 870
Croake, W. D. ..... P 942
Crutchley, D. ..... P 940
Curlator Corporation ..... P 938
Currivan, J. F. ..... P 932
Dadswell, H. E. 881
Daish, A. N. 911
Dalley, O. T. 873
Darmstadt, W. J. 866
Davidson, H. R. 879
Davis, H. R., Jr. ..... P 937
Denyer, W. B. G. 886

Dickey, R. C. 883
Dickinson, F. E. 885
Doudoroff, P. 919
Dreyfus, C. ..... P 930
Duke, E. T. 922
Dungler, J. ..... P 939
E. N. 886
Eastman Chemical Products, Inc. .. 877
Edds, W. ..... P 940
Edlin, H. L. 884
Electric Eye Equipment Company .. P 944
Elliott, N. J. 880
Ellis, B. D. ..... P 942
Elsaesser, F. S. ..... P 941
Elsheimer, R. ..... P 941
Ely, D. A. 893
Enzler, O. 872
Eyring, H. 876
Faeber, H. W. ..... P 945
Farrelly, W. F. 910
Fasoli, P. A. ..... P 940
Fencil, L. K. ..... P 932
Ferlin, H. J. 921
Fischer, E. H. 917
Fleming, H. P. ..... P 947
Fleming Specialty Company ..... P 947
Food Machinery and Chemical Corporation ..... P 941
The Forgrove Machinery Company Limited ..... P 940
Foss, C. W. ..... P 946
Foster, D. H. 875
The Foxboro Company 886
Frank, K. 887
Freeman, C. C. ..... P 930
Freeman, L. 871
Freudenberg, K. 887
Friede, E. 879
Frisbie, S. E. ..... P 944
Frisch, N. ..... P 933, P 934
Frommer, J. C. ..... P 944
Frost, O. W. ..... P 929
Fuqua, M. C. ..... P 928
Gair, R., Company, Inc. ..... P 932, P 933, P 935, P 936
Gayner, E. J., III 867
Geese, C. F. 897
Geffroy, G. ..... P 936
General Mills, Inc. ..... P 933
Gerlach, C. A. ..... P 941
Gibbs, R. D. 889
Gilbert, G. A. 916
Gilchrist, J. ..... P 936
Gilg, F. X. 918
Goodman, L. L. 894
Goodrich, T. W. ..... P 936
Gorham, J. F. 903
Gorman, J. F. 901
Grant, J. 867
Grant, J. N. 882
Graydon, W. F. 920
Greenwood, C. T. 916
Gruenhut, N. S. 885
Hägglund, A. 882
Halter, G. E. 891
Hannunkari, L. 912
Harders-Steinhäuser, M. 894
Harwood, J. ..... P 945
Haskell, H. T. ..... P 936
Heritage, C. C. ..... P 926
Herzog, H. A. 915
Hickey, W. W. ..... P 931
Hill, G. F. ..... P 938
Hill, H. S. ..... P 931, P 938
Hobbs, R. B. 908
Hohl, G. I. ..... P 941
Hood, N. R. 867
Hooker, W. P. ..... P 930
Hosmer, W. A. 886
Humphreys, J. A. ..... P 929
Humphries, J. 899
Hyster Company ..... P 949
The Institute of Paper Chemistry ... P 931
International Paper Company ..... P 937
Jackson, D. R. P. ..... P 935
Jackson, R. W. 882
Jacobs, R. J. 893
Jaspal, N. S. 885
Jayme, G. 894
Jensen, L. B. ..... P 949
Johns-Manville Corporation ..... P 938
Jones, J. K. N. 924
Jullander, I. 877
Jung, H. 918
K-C-M Company ..... P 943
Karabinos, J. V. 921
Katz, M. 919
Keiser, G. W., Jr. ..... P 933
Kerr, C. E. ..... P 941
Kerslake, R. 912
Keyes Fibre Company ..... P 944
Kish, A. F. 909
Kitts, W. D. 868
Klauditz, W. 877
Kleinert, T. 909
Klopfenstein, J. D. ..... P 937
Komeo, O. ..... P 929
Konetzka, W. A. 889
Kraft, —. 894
Kraft Paper Products Limited ..... P 946
Krammes, R. 921
Kröner, K. 923
Kuge, T. 917
Kurth, E. F. 869
L. N. 904
Lach, J. ..... P 939
Lambert, B. 886
Landesman, A. L. 894
Lange, F. ..... P 947
Langston, S. M., Co. ..... P 943
Lasater, J. A. 876
Layte, R. R. ..... P 939
Leffler, N. G. ..... P 927
Leidl, E. 908
Lenard, F. P. ..... P 948
Levine, J. W. ..... P 937
Lewis, H. F. 919
Liebowitz, B. ..... P 930
Lienart, M. ..... P 937
Lieser, T. 875
Limerick, J. M. 914
Limontschew, W. 889
Linteau, A. 884
Long, H. D. 884
Longtin, G. L. R. ..... P 946
Lynch Corporation ..... P 941
Lyon Metal Products Incorporated .. 896
Lyons, C. J. ..... P 931
McConchie, V. J. 907
Macdonald, R. G. 904
Mackenzie, N. A. M. 900
Majewski, Z. J. 891
Makarius, T. F. 911
Marathon Corporation ..... P 929, P 931
Maresh, C. 921
Martin, H. C. ..... P 946
Martin, J. W. 873, 897, 898
Martin, M. E. ..... P 947
Martin, W. H. 889
Masonite Corporation ..... P 926, P 928
Mather, G. 915
Matter, M. ..... P 930
Meikle, R. W. 879
Merewether, J. W. T. 887, 888
Mertle, J. S. 904, 912
Methven, G. W. ..... P 948
The Meyercord Company ..... P 937
Miles, W. S. ..... P 938
Miller, W. A. ..... P 933, P 949
Modern Packaging 897

Mokros, E. R. ..... P 943
Molins Machine Company Limited.. P 935
Monnberg, R. 888
Monsanto Chemical Company. P 929, P 948
Moon, D. G. 881
Mortenson, A. O. 895
Moses, C. S. 913
Muise, H. D. ..... P 933
Mussbach, K. 899
National Paper Bottle Co. Inc. ..... P 938
Neilsen, M. L. ..... P 929
The New Merton Board Mills Limited ..... P 948
Niagara Packaging Machine Corporation ..... P 941
Nicholson, G. W. E. 868
Nilssen, N. E. ..... P 948
Nimer, E. L. 876
Nolten, J. ..... P 939
Nutting, H. G. D. ..... P 938
O'Connell, R. F. 891
Oelkrue, W. L. ..... P 938
Ohl, F. 904
Oliver & Boyd 901
Ono, S. 917
Opler, A. 879
O'Reilly, J. A. ..... P 930
Orr, R. S. 882
Ose, —. 873
Oswin, C. R. 910
Overland, L. D. ..... P 937
Pagendarm, E. J. ..... P 935
Paine, F. A. 896
Paist, W. D. ..... P 930
Palmer, K. W. 881
Paper Trade Journal 890
Paris, P. 916
Parker, L. ..... P 933
Pavlin, R. J. 902
Pearce, J. H. ..... P 927
Pelczar, M. J., Jr. 889
Perry, C. E. 879
Personal Products Corporation ..... P 945
Pesch, A. W. 919
Platt, S. ..... P 932
Plummer, F. L. 893
Pollak, A. ..... 920, P 927
Pratt, Y. T. 889
Processing Equipment Corporation P 941
Prossen, L. F. ..... P 933
Pungs, L. 923
Purcell, W. R. 917
Purolator Products, Inc. ..... P 939
Ralston, A. W. ..... P 945
Ramstad, P. E. ..... P 933
Randall, W. H. ..... P 944
Rasenack, D. 887
Redfearn, J. W. 881
Reese, E. T. 875
Reeves, R. E. 875
Reid, H. A. 902
Rice, W. I. 912
Richard, C. F. ..... P 941
Rist, G. A. ..... P 941
Rist, J. M. ..... P 941
Rochester, D. M. 900
Rockwood, A. G. ..... P 927
Ronssin, S. 924
The Rotareaed Corporation ..... P 931
Roudier, A. 918
Rowe, C. H. ..... P 943
Roy, D. P. 884
Rumberger, G. G. ..... P 929
Runckel, R. O. H. 914
Russell, W. A. 913
Rutt, A. H. 895
Saad, K. N. 916
St. Regis Paper Company ... P 936, P 937
Salvaneschi, P. ..... P 935
Sandberg, O. ..... P 941
Sands, R. G. 881
The Sandy Hill Iron & Brass Works P 940
Sauerman, E. C. ..... P 937
Schambach, H. 914
Schlitz, J., Brewing Company ..... P 942
Schmidt, Erh. 899
Schmidt, Erw. 920
Schmidt, G. 892
Schmidt, R. 899
Schneider, M. ..... P 943
Schoen, W. ..... P 926
Schroeder, W. E. ..... P 943
Schweisheimer, W. 899
Schwenkler, J. J. 873
Sears, G. R. 907
Settele, W. 917
Shallcross, R. 884
Sheffner, A. L. 881
Shell Development Company.. P 946, P 947
Shema, B. F. 880
Shepard, E. L. ..... P 944
Sherk, D. L. ..... P 947
Sherman, J. E. ..... P 949
Sherman, W. D. ..... P 935
Simpson, R. W. 922
Siu, R. G. H. 875
Smiley, W. O. ..... P 944
Smith, J. A. ..... P 931
Smith, R. L. 868
Smolens, H. G. 871
Smyth, F. G. 894
Sohn, A. W. 888
Sooy, B. E. 917
Sperling, A. F. ..... P 943
Stanczak, F. J. 905
Standard Oil Company ..... P 948
Standard Oil Development Company P 928
Star Paper Sales Ltd. 898
Starborg, E. 892
Steckling, C. W. ..... P 942
Stein, Hall & Company, Inc... P 934, P 935
Stensgaard, W. L. ..... P 944
Stensgaard, W. L., and Associates, Inc. ..... P 944
Stillman, N. ..... P 946
Stoakes, H. R. 874
Stoltz, F. M. 921
Straw, C. ..... P 937
Sutherst, T. 892
Svenska Cellulosa Aktiebolaget ..... P 927
Sweeney, F. J. ..... P 933, P 934
Swift & Company ..... P 949
Tall Oil Association 921
Teall, O. E. ..... P 940
Technical Association of the Pulp and Paper Industry 908
Teeple, H. O. 879
Textile Or'ganon 920
Thode, E. F. 901, 903
Thomas, D. B. 922
The Thompson, H. I., Company .... P 933
Thompson, J. O. 925
Thompson, K. 922
Thomson, A. G. 886
Thor, C. J. B. 910
Time, Incorporated ..... P 945
Tokos, G. M. 869
Tolvi, E. K. 905
Tone, F. J. ..... P 946
Tonn, W. H., Jr. 874
Tower, G. E. ..... P 928
Towers, G. H. N. 889
Treiber, E. 909
Treloar, L. R. G. 876
Trunck, E. J. 890
Tsuchihashi, S. 917
Turner, C. H. 866
Turner, J. S. 899, 914
Turvolgyi, B. L. 920
Uarco Incorporated ..... P 939

Underkofler, L. A. 868
Vahle, R. ..... P 935
Vander Wal, R. J. ..... P 945
Van Horn, W. M. 919
Van Hove, J. K. 869
van Nederveen, G. 870
van Wagtendock, G. M. 906
Vermelin, H. 919
Vicario, C. ..... P 931
Vines, O. L. ..... P 944
Voets, J. P. 869
Vogel, L. E. ..... P 930
Vogelsang, G. K. ..... P 927
Vonders, K. ..... P 939
Wacek, A. 889
Wachter, A. ..... P 946
Waddington, J., Limited ..... P 932
Wade, C. F. 918
Wahl, H. F. ..... P 949
Walsh, J. M. 922
Wandell, K. ..... P 942
Wardrop, A. B. 881
Watson, A. J. 881
Weir, R. 901
Weise, F. H. ..... P 941
Weiss, A. J. ..... P 932
Wells, S. D. ..... P 931
Wellwood, R. W. 913
Wester, A. 863
Weyerhaeuser Timber Company ..... P 926
White, W. T. 880
Williams, D. J. 901
Williams, E. J. 875
Williams, M. P. ..... P 945
Williamson, O. H. ..... P 937
Wilson, I. V. ..... P 948
Wilson, J. W. 913
Wincor, W. 909
Wise, L. E. 925
Witt, H. 914
Wittkuhns, B. A. ..... P 938
Woelfer, R. O. ..... P 941
Worthington, V. 908
Worthington Corporation ..... P 927
Wright, J. H. 923
Yule, J. A. C. 911
Zegers, W. F. H. ..... P 939
Zima, J. J. 895

BULLETIN

of

THE INSTITUTE of PAPER CHEMISTRY

AFFILIATED WITH

LAWRENCE COLLEGE

APPLETON, WISCONSIN

AUGUST · 1953

Volume 23 Number 12

LIBRARY NOTES

The Bulletin of The Institute of Paper Chemistry is published monthly at Appleton, Wisconsin, by the Board of Trustees of The Institute of Paper Chemistry. Entered as Second Class matter November 13, 1930, at the postoffice at Appleton, Wis., under the act of August 24, 1912. Printed in U.S.A.

THE INSTITUTE OF PAPER CHEMISTRY

OFFICERS

Ernst Mahler	Chairman of the Board
D. C. Everest	Vice-Chairman of the Board
John L. Riegel	Vice-Chairman of the Board
Westbrook Steele	President
John G. Strange	Vice-President—Treasurer
C. B. Sitterson, Jr.	Secretary
Doris Pickert	Assistant Secretary

BOARD OF TRUSTEES

President of Lawrence College, ex officio
Westbrook Steele, President of The Institute of Paper Chemistry, ex officio

For the term expiring in 1953

Dan K. Brown, Neenah Paper Company, Neenah, Wis.
George E. Dyke, Robert Gair Company, New York, N.Y.
Stuart E. Kay, International Paper Company, New York, N.Y.
A. B. Layton, Crown Zellerbach Corporation, San Francisco, Calif.
Karl E. Stansbury, Thilmany Pulp and Paper Company, Kaukauna, Wis.

For the term expiring in 1954

Sydney Ferguson, The Mead Corporation, Dayton, Ohio.
Donald S. Leslie, Hammermill Paper Company, Erie, Pa.
Ernst Mahler, Kimberly-Clark Corporation, Neenah, Wis.
W. Irving Osborne, Jr., Cornell Paperboard Products Company, Chicago, Ill.

For the term expiring in 1955

D. C. Everest, Marathon Corporation, Rothschild, Wis.
David L. Luke, Jr., West Virginia Pulp and Paper Company, New York, N.Y.
George Olmsted, Jr., S. D. Warren Company, Boston, Mass.
Herbert T. Randall, The Champion Paper and Fibre Company, Hamilton, Ohio.
John L. Riegel, Riegel Paper Corporation, New York, N.Y.

STANDING COMMITTEES OF THE TRUSTEES

Executive Committee: Ernst Mahler, Chairman; D. K. Brown, George E. Dyke, David L. Luke, Jr., and Karl E. Stansbury.
Investment Committee: Ernst Mahler, Chairman; D. K. Brown, and John G. Strange.
Committee on Academic Policy: President of Lawrence College, Chairman; Rex Hovey, Harry F. Lewis, Ernst Mahler, John L. Riegel, Westbrook Steele, and John G. Strange.

Books and Pamphlets Added to the Library During July

BOOKS—CONSERVATION AND RESTORATION

GALLO, ALFONSO. Patologia e terapia del libro. Roma, Editrice Raggio [c1951] 254 p.

BOTANY—ANATOMY

ESAU, KATHERINE. Plant anatomy. New York, Wiley [c1953] 735 p.

CHEMISTRY, ORGANIC—SYNTHESIS

WAGNER, ROMEO B., and ZOOK, HARRY D. Synthetic organic chemistry. New York, Wiley [c1953] 887 p.

FISHERIES

ROUNSEFELL, GEORGE A., and EVERHART, W. HARRY. Fishery science, its methods and applications. New York, Wiley [c1953] 444 p.

IONS

GURNEY, RONALD W. Ionic processes in solution. New York, McGraw-Hill Book Co., 1953. 275 p.

ISOTOPES

SACKS, JACOB. Isotopic tracers in biochemistry and physiology. 1st ed. New York, McGraw-Hill Book Co., 1953. 383 p.

LIBRARIES—PUBLICITY

SPECIAL LIBRARIES ASSOCIATION. *Public Relations Committee.* Our library. [New York] The Association, c1953. 16 charts in spiral binder.

PAPER MAKING AND TRADE

TINDALE, THOMAS KEITH, and TINDALE, HARRIET RAMSAY. The handmade papers of Japan. Rutland, Vermont, and Tokyo, Japan, Charles E. Tuttle Co., 1952. Various pagings.

The book consists of five parts: The fibers (samples in an envelope). The handmade fibers of Japan, foreword by Dard Hunter. The Seki collection. The contemporary collection. The watermark collection.

UNITED NATIONS. *Economic and Social Council. Economic Commission for Latin America.* Fifth session, Rio de Janeiro, Brazil,

9 April 1953. Preliminary study of the possibilities for the development of the pulp and paper industry in Latin America. A joint study by the Economic Commission for Latin America and the United Nations Food and Agriculture Organization. [no place] processed, 1953. 235 + 127 + 29 p.

RESEARCH

BUSH, GEORGE P., and HATTERY, LOWELL H., ed. Teamwork in research. Foreword by Howard A. Meyerhoff. Washington, American University Press [c1953] 191 p.

STAINS AND STAINING

CONN, H. J. Biological stains, a handbook on the nature and uses of the dyes employed in the biological laboratory. Prepared with the collaboration of various members of the Biological Stain Commission. 6th ed., rev. with the assistance of Elmer H. Stotz and Mary A. Darrow. Geneva, N.Y., Biotech Publications, 1953. 367 p.

WATER—POLLUTION

GREAT BRITAIN. *Department of Scientific and Industrial Research. Water Pollution Research Board.* Report of the Water Pollution Research Board, with the report of the director of Water Pollution Research for the year 1952. London, H. M. Stationery Off., 1953. 64 p.

Survey of Periodical Articles

The following are abstracts of opinions expressed by writers in the technical journals. The Institute of Paper Chemistry takes no responsibility for the opinions here summarized.

ACID PLANT

ANON. A new acid tower at the Edsvalla sulfite mill. Svensk Papperstidn. 56, no. 11: 431-3 (June 15, 1953). [In Swedish]

The old wooden acid tower of the mill was replaced by a new, isolated, slightly conical, reinforced-concrete construction (height about 41 m.) with an acid-resistant ceramic lining supplied by the German firm Keramchemie. Details of the unusual construction and its advantages are given. 3 figures. E.S.

ACID RESISTANT MATERIAL

WESTER, A. Acid resistant linings in the pulp and paper industry. Assoc. tech. ind. papetière, Bull. no. 4: 89-92 (1953). [In French]

The author discusses the correct installation of acid-resistant ceramic or carbon brick linings with suitable cements, with particular reference to the products of the Swedish company Höganäs & Cie. Special mention is made of two mortars, Habenit S (a mixture of a phenol resin and ceramic powder) suitable for digester linings and Habenit E (containing a natural resin) for applications where high elasticity is essential. 5 figures. E.S.

ADHESIVES

ANON. Hot melts bind a market. Chem. Week 73, no. 3: 68, 70 (July 18, 1953).

The advantages of the new synthetic-resin, hot-melt adhesives for bookbinding, particularly paperbound books, include immediate setting on cooling; the formation of a tough, strong, mildew-resistant bond; and the fact that they are unaffected by weather conditions. However, their use produced another problem for the papermaker in the regeneration of the trim; any synthetic adhesive cut off with the paper was insoluble in the normal alkali solutions. A mere two pounds of this contaminant can ruin 200,000 pounds of waste paper. Although alkali-dispersable varieties (such as Du Pont's polyvinyl acetate-crotonic acid copolymer) have since been developed, clean white trimmings are usually not subjected to an alkali bath. This may be one of the reasons why most magazines still use water-soluble animal glues; *Fortune* and *Reader's Digest* form an exception. If all magazines, telephone directories, and catalogs were able to use the new method, the market for the synthetic bookbinding adhesives could expand from the present two million to 10 to 12 million pounds. The current price (about twice that of the older adhesives) and the impossibility of trim disposal through ordinary channels are still controlling factors. 1 diagram. E.S.

ADVERTISING

ADVERTISING AGE. Cost of advertising up 5% in 1952. Newsprint Service Bur. Bull. no. 422: 2-3, 8 (March, 1953).

According to a study published in the March 2, 1953 issue of the above maga-

zine, the cost of advertising rose sharply in 1952; detailed data for newspapers, magazines, business papers, farm papers, radio, and television are given. Only television shows a definite downward trend. The 1953 national advertiser must spend at least 5% more dollars to reach the same number of persons he did in 1952. E.S.

AIR FILTERS

CAMBRIDGE CORPORATION, *Syracuse, N.Y.* Progress in air filtration. Chem. Eng. 60, no. 7: 124, 126 (July, 1953); *cf.* B.I.P.C. 23: 703.

The Absolute air filter made from specially treated pulp and fine asbestos fibers is described; the filter paper is formed into a closely pleated construction with corrugated cardboard separators. The construction is similar to the Ultra-Aire filter described in the previous reference. Preliminary tests indicate that the filter stands up well against moderate concentrations of ammonia, caustic, hydrochloric, or hydrofluoric fumes, but will not withstand high concentrations. The recommended temperature limit is 220°F. The filters deteriorate under prolonged exposure to 250° or above. A new high-temperature filter is under development. 1 table and 2 figures. E.S.

ALKALINE PROCESSES

BERTHIER, RENÉ. A process of cooking maritime pinewood in the presence of sodium polysulfides. Assoc. tech. ind. papetière, Bull. no. 4: 93-106 (1953). [In French]

[In this work, the percentage of sulfidity is expressed as $100 \times (Na_2S$ [g./l.] / NaOH [g./l.]).] In France, at the outset of a normal kraft cook, the sulfidity is usually about 15%, and at the maximum temperature of 170°C. the sodium sulfide concentration often drops to 3-4 grams/liter. Thus the objectives of the kraft cook (i.e., a stronger pulp) are in part lost. To increase the concentration of sodium sulfide at advanced stages of the digestion, the author introduced sodium polysulfide into the cooking liquor. A stock solution was prepared by treating 10 liters of 21% sodium hydroxide with 3 kg. of sulfur at 130-135° under nitrogen for two hours in a stainless steel digester. The filtered solution then contained about 210 grams/liter of sodium polysulfide, very small amounts of sodium sulfide, and 60 grams/liter of sodium thiosulfate. This liquor was then diluted with aqueous sodium hydroxide in amounts that varied depending on the type of cook desired. Methods of analysis are outlined for the following components of white liquor: total sulfur (determined after appropriate oxidation as sulfate), sulfur present as sodium thiosulfate, and the so-called "active sulfur" (the sum of sulfur present in the polysulfides and that eventually present as sodium sulfide). In the absence of sulfates, this active sulfur is found by subtracting that in sodium thiosulfate from the total sulfur. More direct methods for determining this active sulfur are also outlined. The alkalinity of the white liquors was determined by titration, making the necessary allowance for the error caused by the presence of sulfides. The stock solution contained no sulfates. The author also introduces the term "apparent sodium sulfide" (I), which seems to be the sum of the sodium sulfide present initially in a liquor plus the sodium sulfide corresponding to one atom of sulfur per mole of sodium polysulfide present. The "apparent alkalinity" (A') equals sodium hydroxide plus (I); and the "apparent sulfidity" (σ') equals (I) (in grams/liter)/sodium hydroxide (in grams/liter). The analysis of black liquors included sodium sulfide (determined by precipitating silver sulfide), the total solids, and total sodium carbonate, as well as a conductometric analysis. Basing his work on that of Borlew and Pascoe (*cf.*

B.I.P.C. 16: 326-7), the author devised an electrometric silver nitrate titration method for the determination of sodium sulfide (described in great detail together with sketches). The various cooks are fully described, and the results are given in extensive tables. These include liquor analyses, cooking schedules, pulp yields, permanganate and chlorine numbers, and pentosans in the pulps, as well as substance, burst, folding endurance, tensile strength, tear, porosity, etc. When (A′) was kept constant at 21% (based on dry wood), an increase in (σ') caused an increase in pulp quality between 21.5 and 29%. The optimum percentage of sulfur was about 6% based on the dry weight of the wood. When (σ') was kept constant at 20%, a moderate increase in (A′) had little effect on pulp yields and none on pulp quality. Recycling black liquors gave rise to hard pulps, poorer in quality, but still comparable to some commercial kraft pulps. Kraft cooks in which only sodium hydroxide and sodium sulfide were used, and in which the sulfidity was kept constant and the active alkali increased, showed decreasing pulp yields and lowered quality. The importance of using sodium polysulfide was evidenced from two kraft cooks: (*a*) using only sodium sulfide (total sulfur, 1.65%) and (*b*) using sodium polysulfide (total sulfur, 5.8%), in which the resulting pulps showed almost identical chlorine numbers and very similar permanganate numbers. Cook (*b*) gave a much stronger pulp in higher yield than did (*a*), and this superiority was maintained when these pulps were bleached. This was also shown by the higher average D.P. of the pulp from (*b*) and the superior quality as gaged from chain-length distribution studies. Using 215 kg. of wood, an ordinary kraft cook gave 100 kg. of 90% pulp, whereas the sodium sulfide kraft cook gave 153 kg. of 90% pulp. These advantages are correlated with the fact that sodium polysulfide is converted into sodium sulfide at the cooking temperatures, and that at the end of such a cook, the concentration of sodium sulfide was actually higher than at the start of the digestion. Despite the reported advantages of sodium thiosulfate, this has no effect on either the pulp yield or quality in the case of maritime pinewood. In the absence of wood or sodium hydroxide, sodium polysulfide decomposed only partially into sodium sulfide and sodium thiosulfate, and elemental sulfur was finally precipitated. The mechanism of a sodium polysulfide decomposition is discussed; it is evidently accelerated by sodium hydroxide, glass, and porous materials. The commercial possibilities of using polysulfides are pointed out; however, the use of sodium polysulfide leads to corrosion problems, and demands a greater consumption of chemicals. The possible recovery of the sulfur from the black liquor, and the economies of such recoveries are discussed. 16 tables, 5 figures, and 7 references.

L.E.W.

BROWN, J. L. The kraft liquor cycle from an operator's viewpoint. Tappi 36, no. 7: 129-32A (July, 1953).

The basic principles of liquor-cycle operation in kraft pulping are well defined and, with slight variations, the process is the same for the entire industry. The selection of equipment is governed by balancing efficient operation and low maintenance against the availability of capital and the cost of depreciation. Serious consideration must be given to the physical location of the various units; personnel requirements can be minimized by intelligent engineering in locating the operating areas in such a manner that all operators are fully employed. The key to successful operation is trained personnel. Reliable recording and controlling instruments, suitably located and adequately maintained, are essential. The operators must be trained to make full use of them. Steady and continuous operation is only possible by a planned maintenance program. Today, the process is continuous and simpler, although the operating requirements are more exacting. The consolidation of the various units makes for lower operating cost and less personnel; better equipment design makes higher levels of performance possible. E.S.

TURNER, C. H. Soda pulping of *Eucalyptus gigantea*. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 89-103; discussion: 103-4 (1952).

The author presents the results of studies on the pulping of *E. gigantea* with caustic soda. Four series of pulps with permanganate numbers 10, 15, 20, and 35 were prepared by cooking at 170°C.; in each series the permanganate number was kept constant at different cooking times (0.125 to 6 hours) by varying the soda charge to suit the cooking time chosen; for example, the cooking time of 0.125, 0.5, 1, 2, 4, and 6 hours was used with a soda charge (percentage of sodium hydroxide/ovendry wood) of 100, 35.8, 26.3, 21.8, 19.5, and 18.7, respectively, to prepare pulps with permanganate number 15. For each series, the effect of changing the cooking time and soda charge on yield of unbleached pulp, apparent D.P. (after sodium chlorite treatment), actual bleach demand to brightness 80 (Photovolt), and the retention time necessary to exhaust this amount of bleach were determined. The results show that at each permanganate-number level, highest D.P. and lowest bleach demand and retention time occur when the cooking time used is between 0.5 and one hour. On the other hand, the highest yield is obtained when the cooking time is from two to three hours. As cooking time increases from 0.5 to six hours, the D.P. of the pulp at any one permanganate number decreases steadily, whereas bleach demand and retention time increase. The use of the very high soda charges which are necessary for cooks of less than 0.5 hours leads to a marked reduction in yield and severe degradation, as indicated by the results for the determination of D.P. In addition, a pink coloration appears which is difficult to bleach; thus bleach demand and retention times for these pulps are relatively high. The permanganate number for these laboratory-cooked pulps is shown to be directly proportional to bleach demand (single-stage hypochlorite treatment) only when the cooking time is constant, and as cooking time is increased, the ratio of chlorine requirement to permanganate number increases. 1 table, 12 figures, and 5 references. E.S.

ALKALINE PROCESSES—FURNACES

DARMSTADT, W. J. New developments in recovery furnace design. Tappi 36, no. 7: 289-91 (July, 1953).

Advances in the design of recovery furnaces by The Babcock and Wilcox Co. have been directed toward lower maintenance, higher efficiency, increased availability, and ease of operation. Steam shatter jets are now arranged in the smelt spout hoods to reduce the explosive violence and dissolving-tank noise to an acceptable level. Close supervision of the air flow by the operator is reduced by the application of automatic air-flow controllers. An additional water-cooled surface is incorporated into the furnace-floor design to reduce maintenance and provide a positive seal against smelt leakage. The boiler surfaces are designed around the soot blowers. Where economically sound, all retractable-type blowers are recommended. Although the cyclone contact evaporator is not universally accepted, the simplicity of design and operation plus low maintenance have proved thoroughly acceptable in those mills where it has been used. The increased thermal efficiency, low initial cost, and high availability are the principal advantages of the Pease-Anthony venturi fume scrubber. Pilot-scale operation of recirculating flue gas to the char bed through primary air ports indicates a practical means of reducing and controlling furnace temperatures. E.S.

ASSOCIATIONS

BRITISH PAPER AND BOARD MAKERS' ASSOCIATION. *Technical*

Section. Technical Section activities. World's Paper Trade Rev. 139, Technical Convention no.: 8, 13-14, 16 (March, 1953).

Excerpts from the annual report for the year ending Dec. 31, 1952 are presented, covering the activities of the Technical Section and including committee reports (paper testing, publications and library, pulp evaluation, education, fastness to light, and soda recovery). E.S.

BURNS, IAN G. Current reflections. Contrasts. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 30, no. 1: 4-5 (February, 1953).

With reference to the dramatic contrast between the Arabs in Algeria pulling esparto grass by hand and the enormous development of the pulp and paper industry in the United States, the author discusses the possibilities for adjustments of the British paper industry to the progressive technical advances and the part the Technical Section is playing through its timely contributions to the better understanding of urgent current problems. E.S.

GAYNER, E. J., III. "The pay-off." Paper Mill News 76, no. 25: 153-4, 156 (June 20, 1953); Southern Pulp Paper Mfr. 16, no. 7: 94-7 (July, 1953).

Emphasizing the need for an effective, well-run, well-organized association of the practical operating men in the industry, the author discusses the constantly recurring and growing criticisms from top management of the various companies of the type of meeting held by the Superintendents Association. Some of these criticisms are based on poor information or misrepresentation; nevertheless, the need for overcoming such criticisms exists and all members have to do their part to offset them. As an example the fact is listed that out of the 500 members registered at the Atlanta, Ga. convention, only approximately 150 attended the technical meetings one afternoon. Industry is entering a competitive era, or is rather already in it, and costs, progress, and improvement have become real factors in plants and companies. Management of companies cannot be expected to authorize expenses which will not bring a fair and honest return. The type of program prepared for this convention was of a high order and the general conduct of the people at the meeting on a high level. The job of preparing such meetings should not be left to the officers, trustees, and directors of the conventions; each individual should strive to overcome existing shortcomings (i.e., contribute to an improved attendance), so that the companies supporting the Association will feel justified in doing so, and those on the other side of the fence will be willing to change their opinion. The Association deserves to be supported by the entire pulp and paper industry. E.S.

GRANT, JULIUS. Current reflections. Progress. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 30, no. 3: 62-4 (June, 1953).

Following a brief discussion of the tremendous change which came over the status and sphere of activities of the technical man, the author postulates that in spite of mechanization human values are not disappearing from the industry. A new generation of mill workers is growing up whose craft will be in the knowledge of what they are doing and why they are doing it. The Technical Section may play a significant part in bringing this new type of craftsman into being, as it has raised the status of the technical man in the past. E.S.

HOOD, NORMAN R. The British Paper and Board Industry Re-

search Association; record of substantial progress. World's Paper Trade Rev. 139, Technical Convention no.: 2, 4, 6 (March, 1953); *cf.* B.I.P.C. 23: 704-5.

The author reviews briefly the progress made on two investigations currently being carried out by members of the Association under the headings: (*a*) physics of water removal (factors influencing the drainage on a Fourdrinier wire) and (*b*) fiber characteristics (before, during, and after beating; in this instance, methods of measuring specific surface are evaluated). E.S.

NICHOLSON, G. W. E. ["The pay-off." Part II] Wonderful possibilities. Paper Mill News 76, no. 25: 158, 160, 162; discussion: 162, 164 (June 20, 1953); Southern Pulp Paper Mfr. 16, no. 7: 101-5 (July, 1953).

The author emphasizes that no company sends its people to any meetings—whether national or sectional—just for the sake of their having a good time; there must be a serious and business-like purpose. The company with which the author is affiliated makes it a hard and fast rule that anyone sent to the meeting must write a report. The men are expected to listen to papers that are presented and to exchange views and discuss matters with their colleagues. The young men are very anxious to come back and prove that they have seen and learned about things which can be applied in the company's case. The leaders of the Superintendents Association should give more attention to the program and lay less stress upon the importance of entertainment, and the companies will send more of their men to these meetings. E.S.

BACTERIOLOGY

ANON. Bag paper and hygiene. Allgem. Papier-Rundschau no. 8: 328-30 (April 20, 1953); Das Papier 7, no. 11/12: 209-10 (June, 1953); Wochbl. Papierfabr. 81, no. 9: 307-8 (May 15, 1953). [In German]

The use of paper grades containing regenerated stock for the packaging of foodstuffs is sometimes considered objectionable from a hygienic viewpoint. A German association for the promotion of waste-paper collection in Düsseldorf sought the expert opinion of two medical scientific institutions in this matter. In the manual folding and pasting of paper bags it may be assumed that part of the micro-organisms present on the hands of the workers will adhere to the paper after conversion. Paper samples prepared from virgin pulps and regenerated stock were supplied to both institutions, which investigated independently their tendency for absorbing and holding bacteria. Details of the methods employed in both cases are described. One institution found that smooth and absorbent papers are more liable to pick up bacteria. However, both testified that paper, irrespective of furnish, is an unsuitable medium for promoting bacterial growth; under certain conditions it even inhibits the same. The paper-manufacturing process, i.e., drying at elevated temperatures, is sufficient to destroy all pathogenic germs. One institute, a dermatological clinic, applied samples directly to the skin of infected patients. In isolated cases, the growth of yeasts could be determined after a few days on both types of samples; there was no difference between the papers made from virgin pulp or waste paper. 2 tables in the first reference. E.S.

UNDERKOFLER, L. A., KITTS, WARREN D., and SMITH, ROBERT L. Soluble cellulose derivatives as substrate for ruminal micro-

organisms. Arch. Biochem. and Biophys. 44, no. 2: 492-3 (June, 1953).

Agar media containing carboxymethylcellulose-70-L (Hercules Powder Co.) was found to be ideal for the isolation of cellulolytic rumen bacteria. One cellulolytic rumen isolate has remained viable for two months without transfer after growth in a broth medium containing CMC-70-L. The cellulose-digesting characteristics of this organism have remained unchanged after repeated transfers upon this medium over a period of four months. 3 references. B.F.S.

VOETS, J. P., and VAN HOVE, J. K. Purification and cellulolytic activity of *Cellvibrio*. Nature 171, no. 4363: 1073-4 (June 13, 1953).

The authors have found that most species of *Cellvibrio* can be isolated and purified on a cellulose medium which contains the common minerals, 0.1% farmyard-manure extract, and 0.2% cellulose. Pure strains isolated from this medium have greater cellulolytic activity than mixed cultures. 1 diagram. B.F.S.

BAGASSE

ANON. New newsprint process defies old snares. Chem. Eng. 60, no. 7: 136, 138-9 (July, 1953); *cf.* B.I.P.C. 22: 809.

Valentine Pulp & Paper Co., a newly organized subsidiary of Valite Corp., is building a 50-ton/day newsprint plant at Lockport, La. in a gas-rich, sugar-producing area. Newsprint of 100% whole-bagasse pulp will be produced by a modified Powell process (patents issued and pending). The bagasse bales collected in the fall and early winter will be piled in checkered stacks, so that initially intense fermentation takes place, then stops altogether whereby the moisture content is reduced from 50 to 20%. A light spray of boric acid is then applied as a preservative. The shredded bagasse will receive a prehydrolysis treatment in rotary digesters, followed by alkaline extraction under heat and pressure. The contents of the digesters will be blown into a blowpit, washed in brown-stock washers, and passed over a coarse screen to bleachers. The bleached pulp after washing will be subjected to a light refining treatment before being sent to the paper machine; from here on the handling of the pulp will be conventional. Water requirements/ton of pulp in the Powell process are lower than for standard processes; the waste-disposal problem is also less than in a wood-pulp mill of comparable size. The plant is expected to start operation at the end of 1953; it will serve as a pilot plant for other units of larger size to be built in the sugar-growing areas of the world. 1 flowsheet. E.S.

BARK

KURTH, E. F. Chemicals from Douglas-fir bark. Tappi 36, no. 7: 119-22A (July, 1953); *cf.* B.I.P.C. 23: 233.

This is a slightly revised form of the original article. 2 tables and 10 references. E.S.

KURTH, E. F., and TOKOS, GEORGE M. The chemical composition of grand fir bark. Tappi 36, no. 7: 301-4 (July, 1953).

Samples of grand fir bark were collected from the top, middle, and bottom sections of 10 trees, divided into three age groups: 165 to 170 years, 196 to 225 years, and 245 to 257 years. The nine samples were successively

extracted with hexane, benzene, ethyl ether, hot water, and alcohol to show the distribution and amount of extractives. Analysis showed the hexane-soluble material to be principally a wax. The benzene, ether, and alcohol-soluble materials were obtained only in small yields and were not further investigated. The tannin content was 7.13% of the ovendry weight of the unextracted bark. A carbohydrate material, obtained from the hot-water extract, contained 17.7% tannin, 8.2% of an insoluble material, 15.6% uronic anhydride, 15.72% pentosans, 1.1% mannan, and other hexosans. A gum was obtained from the hot-water extracted bark residue by additional extraction with 0.5% ammonium oxalate solution. This material was found to contain 14% mannan and 48.3% of uronic anhydride which apparently was galacturonic anhydride; its specific optical rotation was +175°. The extractive-free bark residue contained 40.4% lignin and 59.5% holocellulose. 6 tables and 18 references. E.S.

BARKERS AND BARKING—CHEMICAL

CRAIG, JAMES B. Science on the stump. Am. Forests 59, no. 7: 8-9, 32, 34-6 (July, 1953).

An 80-man investigating team, exploring the findings of a two-year research project on chemical debarking in Maine, found the process to be an aid to the farmer who has not time for manual debarking and harmless to wildlife. The process consists of stripping a four- to six-inch girdle on the base of the tree and painting the area with sodium arsenite. Within six months to a year the chemical will have stripped the bark from the tree trunk. 2 illustrations. R.A.S.

BEATING

CORTE, HEINZ. An abbreviated method for determining the beating behavior of sulfite and semichemical pulps. Das Papier 7, no. 11/12: 196-205 (June, 1953). [In German]

A method is described by the use of which the curves for the development of the beating degree, breaking length, burst, and stretch can be calculated from the values determined at two points under standard conditions, i.e., before beating and at 50° S.-R. If a still higher accuracy is desired, values obtained at a third point (for instance, 30° S.-R.) may be included. The calculations are carried out nomographically with the aid of two calculators specially constructed for this purpose. The method is limited to sulfite and semichemical pulps. The agreement of the data obtained in this manner with the results of complete measurements (carried out by the standard procedure and based on 574 qualitative and quantitative tests) is discussed. 3 tables, 5 figures, and 6 footnotes. E.S.

VAN NEDERVEEN, G. Initial experiments on the beating process. Papierwereld 6, no. 9: 291-304 (April, 1952); Paper-Maker (London) 125: 8-10, 12-14 (Mid-Summer, 1953). [Original in Dutch with English summary; second reference in English]

Different methods for evaluating the effect of the work of the beater on the important properties in the finished paper are reviewed, and their shortcomings for this purpose are pointed out. Freeness measurements with the Schopper-Riegler or Canadian freeness testers give no indication of the type of beating (shortening, swelling, crushing, or splitting) which has been applied. The centrifuge method of Jayme and Rothamel (*cf.* B.I.P.C. 18: 700-1) and fractionation in the H.S. equipment (first described by Brecht and Trenschel, *cf.* B.I.P.C. 9: 211) have been used in the evaluation of the results of the present study. Beating of different kinds in a Wennberg

laboratory hollander (similar to the Valley beater) (I), a Lampén mill (II), and a Multimix kitchen mixer (III) has been investigated, using the above techniques on softwood sulfite and sulfate, hardwood, rag, and straw pulps. It was found that each instrument gives a different kind of beating not brought to light by measuring the freeness in a tester like the Schopper-Riegler. (II) increases the fine and middle fractions, at first at the expense of the coarse fraction and, on continued beating, the middle fraction also disappears. Microscopic examination of the beaten pulp showed that (II) has a marked shortening and fibrillation action on the fibers. Beating in (III) gives quite different results. The finest fraction remains nearly constant to about 45° S.-R., and the middle fraction increases only slightly. Above 45° the coarse fraction remains constant, and the finest fraction increases only at the expense of the middle fraction. Microscopic examination shows no shortening or cutting of the fibers, and external fibrillation is hardly visible. Beating in (I) at first corresponds to some extent with beating in (III), i.e., up to 50° only a small fine fraction has been formed. Beyond 50°, the coarsest fraction decreases strikingly in favor of the middle fraction and not in favor of the finest fraction. The bulk of sheets beaten in (II) decreases rapidly with increasing beating degree up to 45°, then remains constant; it decreases very slowly in sheets beaten in (III) and more rapidly in those beaten in (I). Beating in (I) and (II) increases tensile strength and breaking length to nearly the same extent, whereas in (III) lower values are obtained; the differences, however, are not very striking. Beating in (II) decreases tear rapidly to a low value, which is not observed after beating in (III) and in (I) only after 80° has been reached. Folding endurance showed a very marked increase with decreasing freeness after beating in both (II) and (III). Since it has been found that the folding value depends at least on the tensile strength and on the suppleness of the fibers, it may be concluded that in one type of mill the one factor predominates and in the other kind of mill the other. The relationship between the characteristic difference in the beating action and the resulting sheet properties is discussed. The possibility of practical application of the data is mentioned. 18 figures and 14 references in the first, and 15 references in the second reference. E.S.

BIOLOGICAL TESTING

FREEMAN, LOUIS. A standardized method for determining toxicity of pure compounds to fish. Sewage Ind. Wastes 25, no. 7: 845-8 (July, 1953).

A method has been developed for determining the toxicity-tolerance limits of fish to pure compounds; the method has the advantage over previous methods of being readily reproducible in any laboratory. This is made possible by the use of a standardized water, designated as "standard reference water," for dilution and acclimatization purposes. This water is readily duplicated, as it is prepared from distilled water and given amounts of inorganic salts. The method has been used successfully for bio-assay work employing both invertebrate and vertebrate animals, and is currently being employed in a laboratory at Louisiana State University. 8 references. E.S.

BLEACHING

SMOLENS, H. G. Hydrogen-peroxide bleaching of textile materials. Am. Dyestuff Reptr. 42, no. 13: P408-10 (June 22, 1953); *cf.* B.I.P.C. 23: 160.

Details of the cold-bleach process, the steam-bleach process, and the white-scour process with hydrogen peroxide for textiles are given. 1 reference. E.S.

BLEACHING—GROUNDWOOD

ANON. Bleaching of groundwood pulp. Papier, carton et cellulose 2, no. 2: 65-8 (May-June, 1953). [In French]

The different processes used for the bleaching of mechanical pulp are reviewed, including hypochlorites, hydrogen and sodium peroxide, sodium bisulfite, and sodium or zinc hydrosulfite. The cost of each process under French conditions and the properties of the bleached pulps are discussed. 2 tables and 6 references. E.S.

BOWDEN, HAROLD. The bleaching of groundwood with peroxides. Paper-Maker (London) 125: 5-7 (Mid-Summer, 1953).

A review of the process with reference to its use in Europe is presented. There is no reason why groundwood bleaching with peroxides should not become established in the groundwood mills of Scandinavia and the paper mills of the United Kingdom. Pulp mills and integrated paper mills have the advantage that the groundwood can be bleached fresh so that less peroxide is required. The paper mill which purchases its groundwood for bleaching will encounter a heavier peroxide consumption; this could be overcome by the installation of a simple three-stage bleach plant involving a hypochlorite stage, alkali wash, and high-density peroxide stage. 1 table and 9 references. E.S.

BLEACHING—SULFATE

ANON. Oulu Oy's semi-bleaching plant. Finnish Paper and Timber 4, no. 3: 33-4 (April, 1953). [In English]

A brief description of the new three-stage semibleaching plant at the sulfate mill at Nuottasaari is given; the bleaching involves chlorine, alkaline, and hypochlorite treatments, followed by acidification with sulfur dioxide. Before reaching the drier, the stock is purified in a battery of Vortraps. The highest whiteness produced is approximately 75° G.E. Since limited available space had to be utilized in the construction of the plant, an unusual feature in Finnish latitudes involved the construction of the bleach towers in the open; they are constructed of plate iron, rubber covered on the inside, and insulated. 5 illustrations. E.S.

BOARD

ANON. A new high-grade construction material of wood chips and cement. Svensk Papperstidn. 56, no. 11: 426-7 (June 15, 1953). [In Swedish]

A brief reference is made to Spånit, a Swedish construction material of wood chips and cement in a stable permanent combination. Blocks, beams, and tiles can be prepared; the material is light in weight, strong, fire resistant, and heat insulating. The chips are treated with certain chemicals so that the wood constituents harmful to cement (resins, sugar and fatty acids, etc.) are removed; after a few days the chips are ready for mixing with the cement. Licenses to cement factories in all parts of Sweden will be granted by the holder of the patents, Spånitbolaget in Arvika. 1 illustration. E.S.

BOARD—CONVERSION

ENZLER, O. "Creasing and rotary creasing." Allgem. Papier-Rundschau no. 9: 380-1 (May 5, 1953). [In German] *cf.* B.I.P.C. 23: 473.

The author criticizes some of the calculations of Paris in the economics section of the original article. A brief reply by the first author is appended. E.S.

MARTIN, JOHN W. Quality control increases box production. Am. Boxmaker 42, no. 6: 11-13 (June, 1953).

The plant and equipment of the Ace Carton Corp., Chicago are described. Particular mention is made of the pretesting laboratory in which boxboard is tested for such properties as breakage point, oil absorption, color density, alkalinity, tensility, and caliper, and inks are checked for their satisfactory performance on the boxboard. 7 illustrations. R.A.S.

BOARD, BOX

SCHWENKLER, J. J. Board requirements for folding cartons. Am. Boxmaker 42, no. 6: 14-15 (June, 1953); Paper Mill News 76, no. 30: 12, 14 (July 25, 1953).

To meet the requirements of high-speed production and trends in customer demand for multicolor, gloss-ink printing with eye-catching design, the author considers the following properties essential: for printing—uniform caliper, weight, and moisture content, and freeness from curl and foreign materials; for cutting—uniform caliper and moderate moisture; and for gluing—a minimum of sizing. Uniformity throughout the run is the most important requirement in modern carton manufacturing. 1 table. R.A.S.

BOARD, CORRUGATED

OSE, —. The terminology of corrugated board. Allgem. Papier-Rundschau no. 9: 378-9 (May 5, 1953). [In German] *cf.* B.I.P.C. 23: 236.

Additional suggestions for corrugated-board definitions are given, originally submitted by Herbert Böttger in *Papier und Druck*. 6 figures. E.S.

BOARD DRYING

DALLEY, O. T. Factors influencing the drying of insulating board. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 105-32; discussion: 132-3 (1952).

The mechanism and rate of drying under constant conditions of insulating board varying in weight from 680 to 965 lb./1000 sq. ft. have been studied. The general theory of drying of solids is discussed at some length and this theoretical information applied to the experimental data. It has been established that the drying of insulating board from the press-moisture stage is divided into three distinct phases. In the first phase, which is of limited duration, the removal of water is influenced by temperature, humidity, and air velocity. At the completion of this initial drying period there is a sharp transition to the second and major part of the total drying time during which the drying is affected mainly by temperature; the time of drying during this phase is proportional to the square of the thickness of the board. The third and final phase covers approximately one third of the total drying time and involves the removal of the last 10 to 12% of the water in the board under conditions where temperature is again the main controlling factor. 1 table, 12 diagrams, and 12 references. E.S.

BOARD MILLS

ANON. National Container 25th anniversary. Tappi 36, no. 7: 96-100A (July, 1953).

Following a brief history of the company (originally making corrugated shipping containers from purchased board) founded in 1928, the long-range expansion program to obtain an adequate supply of its own paperboard is recorded. In 1938, the kraft, pulp, and board mill built at Jacksonville, Fla. started to operate; in 1944, the company acquired the corrugating-board mill at Big Island, Va., in 1945, the kraft board mill at Ontonagon, Mich., and in 1946, the kraft mill at Tomahawk, Wis. whose entire operation was converted to boardmaking. In 1951, construction on the 500-ton/day kraft, pulp, and board mill at Valdosta, Ga. was started. In addition, a number of box plants and converting units were either purchased or established all over the United States. 7 illustrations. E.S.

ANON. The new hardboard mill of OY Wilh. Schauman AB. Finnish Paper and Timber 4, no. 3: 30-1 (April, 1953). [In English]

A brief description of the installations in the new board mill at Nyslott is given. The principal items include a Wiggers chipper, four Asplund Defibrators, a board machine constructed by Söderhamns Verkstäder AB with a special sizing and surface coating unit, a Motala board press, and special hardening and humidfying departments. 3 illustrations. E.S.

CAUSTIC SODA

TONN, WILLIAM H., JR. Alkaline gulf stream. Chem. Week 72, no. 26: 60-2 (June 27, 1953); *cf.* B.I.P.C. 23: 713.

With reference to the opening of new alkali plants by Columbia-Southern Chemical Co. and the growing unbalance in chlorine and caustic soda production in the Gulf Coast region, possible solutions for the curtailment or disposal of the unwanted caustic soda (manufacture of chlorine without caustic, encouragement of foreign markets on a long-term sales basis, and efforts for the establishment of new local customers—such as rayon, film, and pulp and paper industries) are discussed. 2 tables and 1 map. E.S.

CELLOPHANE

ANON. British Cellophane Limited and their products. Paper Making and Paper Selling 72, no. 1: 51-2 (Spring, 1953).

The products of British Cellophane Ltd., Cellophane cellulose film and B.C.L. polythene film, and the product for which the company is a selling agent, Courtaulds' cellulose acetate film, are described; their properties are listed and present uses of the films are given. The importance of transparent packaging for the export trade is stressed. R.A.S.

STOAKES, HAROLD R. Department store adopts cellophane bag packaging. Am. Paper Converter 27, no. 7: 13-16 (July, 1953); Packaging Parade 21, no. 247: 62-4 (August, 1953).

Advantages in cellophane bag wrapping of textile items at the department store of L. Bamberger & Co. were multiple sales of an item, sales appeal, ensemble sales, and soilage reduction. A table listing the merchandise wrapped in cellophane and the bag sizes used by the company is included. 2 tables and 5 illustrations in the first and 12 illustrations in the second reference. R.A.S.

CELLULOSE

ADAMS, G. A., and BISHOP, C. T. Polysaccharides associated with alpha-cellulose. Nature 172, no. 4366: 28-9 (July 4, 1953).

α-Celluloses were prepared from softwood (I) and hardwood sulfite pulps; wheat, jute, barley, and oat straws; and cotton fiber (II). These preparations were then hydrolyzed, the hydrolyzates properly neutralized and freed from inorganic salts, and then analyzed quantitatively for sugars other than glucose. In all cases excepting that of the α-cellulose from (II), small or even appreciable amounts of xylose were found. Arabinose was present in all α-celluloses excepting those from (I) and (II). Mannose was found only in (I), and the presence of uronic anhydride was indicated (but not proved) in all α-celluloses. 1 table (giving full quantitative data) and 10 references. L.E.W.

LIESER, TH. The macromolecular and micellar nature of cellulose. Holzforschung 6, no. 4: 97-101 (1952). [In German; English summary]

A critical resume is presented, written largely to encourage future research. Assuming that the macromolecular constitution of cellulose is known, the author refers to the importance of clarifying its supermolecular structure, with special reference to its reactions in the solid and dissolved states. 1 diagram and 26 references. L.E.W.

CELLULOSE—DEGRADATION

REEVES, RICHARD E., and BARRETT, BERNARD J. Effect of a wetting agent on the hydrolysis of highly methylated cotton cellulose. Textile Research J. 23, no. 7: 510-12 (July, 1953).

The acid-catalyzed, heterogeneous hydrolysis of a highly methylated cotton cellulose has been investigated, with particular attention to the effect of incorporating a wetting agent in the hydrolysis medium. It was found that the amount of fast-reacting material was small when the aqueous acid did not contain a wetting agent, but was increased severalfold in the presence of an active wetting agent; the rate constant for the slow-reacting material was also increased by it. The minimum viscosity reached during hydrolysis was the same in the presence or in the absence of the wetting agent. 2 tables, 2 figures, and 4 references. E.S.

SIU, R. G. H., and REESE, E. T. Decomposition of cellulose by microorganisms. Botan. Rev. 19, no. 7: 377-416 (July, 1953).

This review attempts to picture the microbial decomposition of cellulose as it is seen today, emphasizing the relationship of the organism to the substrate and the mechanism of breakdown of cellulose. Two phases of the problem, anaerobic decomposition of cellulose in sewage and in the rumen and prevention of deterioration, are omitted; however, references which cover these phases are given. The current review covers the period since 1940 on the subject of aerobic cellulose decomposition; the treatment is focused on cotton fibers, the cellulosic substrate used in most of the basic research on the problem. Particular mention is made of unsolved areas in the hope that greater interest in the field will be stimulated. 6 tables and 189 references. R.A.S.

CELLULOSE—REACTIVITY

FOSTER, D. H., and WILLIAMS, E. J. Reactivity of wood cellu-

lose; treatment with dilute sulphuric acid at elevated temperatures. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 76-87 + 1 plate; discussion: 87-8 (1952).

Holocellulose prepared from samples of *Eucalyptus regnans* F.v.M. wood, and bleached eucalypt soda pulp were hydrolyzed at 160°C. with 2% sulfuric acid in a percolation apparatus, and the rate of cellulose hydrolysis was followed by determining residue weights after various hydrolysis periods. Samples from various portions of *E. regnans* trees were observed to hydrolyze at different rates, but the only appreciable differences were those between tension wood and normal wood cellulose. The former hydrolyzed much more slowly than the latter, and this is correlated with the high degree of lateral order observed in the former by means of powder x-ray-diffraction photographs, and is taken to support the previously proposed hypothesis that rate of hydrolysis is a function of crystallite size (*cf.* B.I.P.C. 22: 244). In one case the rate of hydrolysis of tension-wood cellulose was approximately the same as that of cotton cellulose. The bleached eucalypt soda pulp was hydrolyzed before and after beating for 4500 and 18,000 revolutions in a Lampén mill. No differences in rate of hydrolysis were observed, and from this it is concluded that no new cellulose-crystallite surfaces were formed during beating, and that swelling must have taken place in the amorphous cellulose and hemicellulose portions of the pulp. Values were obtained for the amounts of resistant cellulose in the samples by extrapolation of the hydrolysis graph to zero time, and these results are compared in some cases with those of α-cellulose determinations. E. J. Williams is the author of the appendix which gives the formulas showing the relation between dimensional distribution and reaction rate. 2 tables, 2 figures, and 27 references. E.S.

CELLULOSE—SORPTION

TRELOAR, L. R. G. The absorption of water by cellulose, and its dependence on applied stress. Trans. Faraday Soc. 49, no. 7: 816-23 (July, 1953).

The primary object of the work described was to examine the dependence of the equilibrium water content of cellulose (viscose) filaments on applied tensile stress. For both isotropic and oriented filaments a reversible increase of water content with tensile stress was observed; this effect was in the direction required by thermodynamic theory and of the expected order of magnitude. A precise quantitative test of the theory was not possible on account of the imperfectly elastic behavior of the material. Subsidiary experiments are reported on the variation of length with relative humidity and on the vapor pressure isotherms for isotropic and oriented cellulose. It is shown that, for the isotropic material, the longitudinal swelling can be accurately calculated from the water content, using P. H. Hermans' density data; this calculation, incidentally, provides a useful check on Hermans' figures. Finally, a figure is derived for the water absorption by the isotropic cellulose in contact with liquid water. 8 figures and 3 references. E.S.

CELLULOSE—VISCO-ELASTICITY

LASATER, J. A., NIMER, E. L., and EYRING, H. Mechanical properties of cotton fibers. Part II: Effect of acids on fibers under tension. Textile Research J. 23, no. 7: 481-8 (July, 1953); *cf.* B.I.P.C. 23: 627.

The relaxation at constant elongation of cotton fibers in strong acids (hydrochloric, sulfuric, and nitric) has been examined, and the results are

compared with those previously reported for fibers in air and water. The acids had a more pronounced effect on the slow than on the fast relaxation constants. Apparent and calculated hydrolysis-rate constants are compared. In addition to affecting the relaxation constants of the fiber, the acid solutions caused an "instantaneous relaxation" whenever the acid concentration was above a critical minimum. This suggested that hydrogen bonds of the fiber are attacked by hydrogen ions. Thermodynamic calculations based on the assumption of a pseudo equilibrium between crystalline and amorphous cellulose yield a value of 4 kg.-cal. for the enthalpy of conversion and 12.4 e.u. for the entropy of conversion. 10 tables, 11 figures, and 15 references.
J.O.T.

CELLULOSE AS FODDER

KLAUDITZ, W., and BECKER, M. Digestibility of beechwood holocellulose by ruminants. Holzforschung 6, no. 4: 103-4 (1952). [In German; English summary]

Beechwood chlorite holocellulose (I) (containing 52.8% cellulose, with an average D.P. of 820 and 5.42% lignin) served as fodder for two merino wethers. The degree of digestibility of (I) was 80 to 90%. Further studies are in progress. 3 tables and 4 references. L.E.W.

CELLULOSE ESTERS

EASTMAN CHEMICAL PRODUCTS, INC., *Kingsport, Tenn.* Cellulose polymer. Chem. Eng. 60, no. 7: 228 (July, 1953).

A low-viscosity form of cellulose acetate butyrate, suitable as lacquer for metals, wood, plastics, cellophane, paper, etc. has been developed by the Tennessee Eastman Co. As a paper lacquer the new polymer is said to provide tough transparent coatings highly resistant to grease and water. 1 illustration. E.S.

CELLULOSE ETHERS

JULLANDER, INGVAR. Effect of salts on solutions of ethyl-hydroxyethyl cellulose. Svensk Papperstidn. 56, no. 12: 443-50 (June 30, 1953). [In English; German and Swedish summaries] *cf.* B.I.P.C. 22: 655-6.

Ethylhydroxyethylcellulose (trade name Modocoll) (I) can be separated from aqueous solutions by salts. The salting-out properties of different salts are expressed as flocculation points and quantitatively determined by a method which is similar to the customary salt-point measurements in the viscose industry. Flocculation points have been determined for about 70 salts and three types of (I). A comparison is made with commercially produced methylcelluloses. The effect of a mixture of two salts (sodium sulfate-sodium nitrate) was investigated in one case, and it was found that it is not possible to predict the behavior of a salt mixture from measurements on the single components. The possibilities of relating the flocculation points to hydration numbers or hydration energies of the salts and the relation between flocculation point and water activity are discussed. The changes in viscosity and turbidity of the solutions during the stages preceding the flocculation point were investigated for a few salts. With increasing salt concentration, the viscosity, as a rule, passes through a pronounced maximum, whereas the turbidity changes little up to the flocculation point. 6 tables, 8 figures, and 21 references. E.S.

CHEMICAL TESTING—CELLULOSE

AMERICAN OIL CHEMISTS' SOCIETY. *Cellulose Yield Committee.* Report of Cellulose Yield Committee, 1952-53. J. Am. Oil Chemists' Soc. 30, no. 7: 301 (July, 1953); *cf.* B.I.P.C. 21: 689.

Three sets of second-cut linters were sent out during the past year for yield analyses; on the average the checks were very good. It is recommended that samples still be sent out periodically for check analyses. 1 table.
E.S.

CHEMICAL TESTING—PULP—GASES

BOADWAY, J. D. The determination of total gas in stock. Tappi 36, no. 7: 128-9A (July, 1953).

An experimental method for determining the total stable gas content of stock is described, which involves gas removal by vacuum distillation and evaluation of the volume removed as a change in the absolute pressure of the vacuum system. To make this method applicable to the study of unstable gas, samples in the plant might be taken in sealed pipets and the entire contents transferred to the evacuated flask. 1 figure and 2 references.
E.S.

CHEMICAL TESTING—PULP—XANTHATE VISCOSITY

BRASCH, L. W. Sodium chlorite treatment of unbleached eucalypt soda pulps; effect on apparent degree of polymerization. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 204-12; discussion: 212-13 (1952).

The author describes the work for standardizing the sodium chlorite treatment of unbleached eucalyptus pulps prior to the determination of their apparent D.P. by measuring the viscosity of their cellulose xanthate solutions prepared and tested according to the method of Jayme and Wellm (*cf.* B.I.P.C. 15: 401-2; 17: 58); the viscosity is then related to D.P. by applying the correlations developed by these two authors. The pretreatment is necessary because sodium chlorite insures complete solubility of unbleached pulps. The optimum conditions with regard to amount of sodium chlorite, time, and temperature were found to be 10% available chlorine (added as sodium chlorite) to permanganate number 25 or 15% available chlorine to permanganate number above 25, for 30 minutes at 70°C. Higher sodium chlorite dosages and the extension of the treatment up to four hours causes a considerable reduction in the apparent D.P.; the sensitivity to temperature is insignificant. The standardized procedure has been extensively employed in investigational work on cooking and bleaching; it has proved entirely satisfactory and readily lends itself to multiple determinations on a routine basis. 3 tables, 3 figures, and 4 references.
E.S.

CHEMICALS

CHEMICAL ENGINEERING. Top ten consumers on the chemical hit parade. Chem. Eng. 60, no. 7: 326, 328 (July, 1953); *cf.* B.I.P.C. 21: 691.

Fertilizers (by volume) and textiles (by value) continue to hold down the top spots. Pulp and paper ranked second by volume last year as against third in 1951, whereas paints and varnishes dropped from second to fourth place. 1 diagram.
E.S.

COLORIMETRY

DAVIDSON, HUGH R., and FRIEDE, ELAINE. The size of acceptable color differences. J. Opt. Soc. Amer. 43, no. 7: 581-9 (July, 1953).

To determine the size of acceptable color differences for a particular production problem, about 12,000 individual judgments of the acceptability of 287 samples as matches with 19 standards were made. The samples represented colors in all sections of the color domain and various size color differences from the standards. Colorimetric measurements of the samples were made, and the color differences were calculated according to the several methods currently in use. Color differences were then plotted against the visual judgments of acceptability. Calculations based on rather small modifications of the MacAdam ellipses were found to correlate with the visual results much better than do those based on other methods. Color differences falling within an ellipsoid about 2.5 times the size of those published by MacAdam with a radius vector of about 0.15 Munsell value unit parallel to the Y axis were accepted in 50% of the observations. 3 tables, 11 diagrams, and 13 references. E.S.

OPLER, ASCHER, MEIKLE, RICHARD W., and CHARLESWORTH, MARY JEAN. Automatic calculation of color differences. J. Opt. Soc. Amer. 43, no. 7: 550-1 (July, 1953).

Punched-card operated computing machines have been used to translate from I.C.I. space to the equal visual stimulus space of Adams (*cf.* B.I.P.C. 12: 244). Differences in terms of Judd units are calculated by the machines as well as the original colorimetric integrations. These methods have been used to process several thousand routine reductions of spectrophotometric data and their conversion to Adams space. 7 references. E.S.

CORROSION

PERRY, C. E. Corrosion of sulphate mill digesters. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 134-47; discussion: 147-8 (1952).

A survey of the corrosion experienced in seven digesters at the Australian Paper Manufacturers' Maryvale pulp mill is presented. The digesters include two stainless-steel lined vessels which are used for the kraft pulping of eucalypt and pine chips. The average corrosion rate of the mild-steel digesters was found to be 0.02 inch/year, although in one case it was as high as 0.031 inch. With these corrosion rates it would appear that a mild-steel digester with 1.25-inch walls would have a life of approximately 20 years. For ordinary kraft cooking, it is considered more economical to use mild-steel vessels constructed from 1.25-inch mild steel than to use stainless-clad steel or to line mild-steel vessels. The use of sprayed metallic coatings does not appear a satisfactory method of preventing corrosion in a digester; a sprayed stainless-steel coating sealed with a phenolic resin may be more effective. Corrosion tests indicate that the use of a 5% nickel steel in the construction of a digester would increase its life by almost four times for ordinary kraft cooking. 5 tables, 3 diagrams, and 6 references. E.S.

TEEPLE, H. O. Recovery operation corrosion problems. Tappi 36, no. 7: 127-8A (July, 1953).

The author reviews corrosion problems encountered in the recovery furnace, boiler, and auxiliaries (including dissolving tank, liquor spouts, induced draft fans, salt-cake mixing tank, disk evaporators, and duct work)

of kraft pulp and paper mills, with suggestions for suitable constructional materials. 7 references. E.S.

WHITE, W. T. Notes on materials of construction used in the Australian kraft pulp and paper industry. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 149-76 + 3 plates; discussion: 177-9 (1952).

The paper deals with some of the work undertaken by a group of metallurgists working in the pulp, paper, and board mills of Australian Paper Manufacturers Limited. The results of corrosion tests made by immersing various metals in the liquors normally encountered in the manufacture of kraft sulfate pulp and paper and the experience gained from the use throughout the plant of metallic and nonmetallic lining materials for corrosion prevention are outlined. Investigations into the wear of Fourdrinier wires, the use of free-machining stainless steel for Sutherland refiner disks, tests of materials for use as a paper mill piping, and chimney-stack construction are also described. 8 tables, 5 figures, and 6 references. E.S.

COST—ACCOUNTING

ELLIOTT, NORMAN J. Pricing and estimating. Article 11. Inventory costing and control procedures. Boxboard Containers 71, no. 727: 26-8 (July, 1953); *cf.* B.I.P.C. 23: 800.

The terminal use of the cost data described in previous articles in this series is the application of this information to inventory records. Records of cost data are compared with the monthly profit and loss statements, and estimated costs compared with actual costs. This procedure is recommended for a continual accurate inventory control. 2 illustrations of suggested forms. R.A.S.

DISINFECTION AND DISINFECTANTS

SHEMA, B. F., and CONKEY, JULIAN H. Relative toxicity of disinfectants available for use in the pulp and paper industry. New York, American Paper and Pulp Association, Biological Control Committee, 1953. 18 p.

The results of a study of the relative toxicity of 93 disinfectants to four test organisms (two bacteria, *Aerobacter aerogenes* and *Bacillus mycoides*, and two fungi, *Aspergillus niger* and *Penicillium expansum*) offered to the pulp and paper industry are presented. The experimental procedures for their evaluation are described. In general, the organomercurials or combinations containing them were found to be the most toxic under the conditions employed. However, it does not necessarily follow that these materials will be the most effective under all mill-operating conditions. 3 tables and 4 references. E.S.

DISPENSING CONTAINERS

ANON. Salt tablet container, dispenser is constructed to be "throw-away" unit. Packaging Parade 21, no. 246: 13 (July, 1953).

Morton Salt Co. is selling an inexpensive, throw-away paperboard unit to serve as both container and dispenser for individual salt tablets. A rotatable plastic wheel dispenses tablets one at a time, and a bracket made of cadmium-plated steel with two holes in the bottom facilitates wall installation of the glued assembled dispenser. 4 illustrations. R.A.S.

DRYING—PAPER

SANDS, R. G., PALMER, K. W., and REDFEARN, J. W. Some aspects of drying. Paper-Maker (London) 125: 50-4, 56 (Mid-Summer, 1953).

Questions on contact drying of paper and board submitted by members of the Wye Valley Discussion Group included the effect of permeability of the dry felt, the use of superheated *vs.* saturated steam, the exact mechanism of drying, the calculation of drying requirements, a quick method for measuring humidity at elevated temperatures, stock shrinkage, machine-house ventilation, and heat pumps. Answers were provided by the three discussion leaders. E.S.

ENGINEERING

MOON, D. G. Paper-industry engineers. Mech. Eng. 75, no. 7: 567-8 (July, 1953). [Abridgment] *cf.* B.I.P.C. 19: 697.

A similar description of the role and opportunities of the engineer in the pulp and paper industry as in the previous reference is given. E.S.

EVAPORATION AND EVAPORATORS—SULFITE WASTE LIQUOR

ANON. Channel-switch evaporation. Taylor Technol. 6, no. 1: 3-7 (Summer, 1953); *cf.* B.I.P.C. 23: 803.

The Rosenblad channel-switching evaporator system installed at the Interlake mill of Consolidated Water Power & Paper Co., Appleton, Wis. is described, with particular reference to the central control panel board from which all equipment connected with the evaporators is run; one operator suffices for the entire two-story operation. 8 figures. E.S.

FERMENTATION PROCESS

SHEFFNER, A. LEONARD. Relationship between the oxidative and fermentative phases during adaptation to galactose in *Saccharomyces cerevisiae.* Nature 171, no. 4363: 1073 (June 13, 1953).

Experiments have demonstrated that, during the oxidative phase of adaptation, the yeast cells are capable of fermenting galactose if anaerobic conditions are introduced. The degree of fermentation was found to be correlated with the degree of adaptation during the oxidative phase. It was found that, during the early stages of adaptation and before fermentation started, carbohydrate was being stored as glycogen and glycolytic intermediates, and pyruvate did not accumulate appreciably until the formation of glycolytic intermediates was close to a maximum. 2 references. B.F.S.

FIBER—STRUCTURE

WATSON, A. J., WARDROP, A. B., DADSWELL, H. E., and COHEN, W. E. Influence of fibre structure on pulp and paper properties. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 243-66 + 1 plate; discussion: 266-9 (1952).

An investigation has been made of the influence of the structure and form of the wood fiber on pulp and paper properties. Wood samples with different fiber characteristics have been obtained by taking successive growth rings from a 12-year-old tree of *Pinus radiata* D.Don, thus providing material of increasing fiber length and decreasing micellar spiral angle. Wood chips from each growth ring were cooked by the kraft process to a given permanganate

number; all conditions except time were kept constant. This provided pulps with similar chemical properties but with different fiber characteristics. As fiber length and micellar spiral angle showed progressive changes from pith to bark they could be related only to those test-sheet properties showing steady trends. Tensile strength was related to fiber length at the higher breaking points and, although no correlation could be established, bursting strength and folding endurance showed similar trends. Tear and bulk, however, reached maximum values at the seventh growth ring and could have been little influenced by the changes in fiber length and micellar spiral angle. Good correlations existed between the basic density of the wood and most test-sheet properties of the unbeaten pulp; tear and bulk showed positive, and burst, fold, and air resistance, negative relationships. The factors responsible for differences in basic density had a greater influence on most paper properties than fiber length or micellar spiral angle. The manner in which the morphology and fine structure of fibers influence paper properties is discussed. 2 tables, 15 figures, and 22 references. E.S.

FIBER—TESTING

ORR, ROLLIN S., and GRANT, JAMES N. A single-fiber load-elongation tester for cotton. Textile Research J. 23, no. 7: 505-9 (July, 1953).

A single-fiber tester of the type employing a constant rate of loading is described. Designed especially for obtaining load-elongation curves in addition to end-point data on cotton fibers, it employs coiled-spring loading and optical means of recording. Devices are incorporated which permit cyclic-loading studies and static-life determinations. An oven and humidification tank are provided for testing at various temperatures and under various moisture conditions. 4 figures and 22 references. E.S.

FIRE PREVENTION

HÄGGLUND, ARNE. Fire protection in fiberboard mills; experiences gained from the fire and explosion damage of the Ljusne wallboard mill. Part II. Svensk Papperstidn. 56, no. 11: 415-19 (June 15, 1953). [In Swedish] *cf.* B.I.P.C. 23: 804.

With reference to the disastrous fire at the Ljusne wallboard mill in Sweden, safety directions are deducted for the construction of an entire mill of this type, the individual equipment, storage facilities, and operation of such a plant. The tunnel drier receives particular attention. It should be constructed of noncombustible material, be of moderate size, and be subdivided into individual units, each unit equipped with a sprinkler system which can readily be placed in operation from a safe distance. Superheated steam should never be used for heating. The blades of the fans should be constructed of a nonsparking material, and the fans be installed in such a manner that mechanical friction and sparking is minimized. The possibility that explosive pressures can build up in the drier should be recognized, and safety valves should be installed. Wallboard mills present a definite fire hazard; additional studies for their protection are urgently needed. 4 figures and 5 references. E.S.

FLOOR COVERING

JACKSON, R. W. Vinyl floor coverings. Can. Chem. Processing 37, no. 5: 86, 88-90 (May, 1953).

Following a brief review of the four important groups of nonvinyl resilient floor coverings (i.e., rubber, linoleum, asphalt, and felt base), the

author discusses the composition and manufacture of flexible, semiflexible, and supported vinyl flooring. The supported floor covering consists of a layer of vinyl compound laminated to a nonvinyl underlay (asphalt or synthetic-rubber impregnated felt, α-cellulose paper coated with an organosol, jute backing, or asphalt-saturated felt). E.S.

FOAM

ANON. Holding down the foam. Chem. Week 72, no. 26: 65-6, 68 (June 27, 1953).

Different antifoamers and their possible applications, including use in the paper industry, are reviewed. 2 illustrations. E.S.

FOLDING BOXES

BONINI, JOHN H. Packaging materials and methods. II. Paperboard. Activities Rept. Research and Develop. Associates, Food and Container Inst. 5, no. 1: 52-61 (April, 1953).

The author describes the origin of folding boxes, pulp used, paperboard manufacture and types of board employed, typical folding-carton constructions, their limitations and principal applications in the food industry, and new developments. 4 diagrams. E.S.

DICKEY, ROGER C. The folding carton . . . what it is . . . what it accomplishes. Part 2—Its variations and applications. Graphic Arts Monthly 25, no. 5: 42, 44, 46, 184, 186; no. 6: 36, 38, 40, 42 (May, June, 1953).

The first article deals with the two basic forms of side-seam glued paperboard cartons, the tuck-end and seal-end cartons. In the second article, collapsible boxes, particularly the Brightwood and Beers boxes, and some of their many possible modifications are described. The advantages of folding boxes over rigid setup boxes are emphasized. 23 diagrams. R.A.S.

FORESTS AND FORESTRY

BESLEY, LOWELL. Forestry and pulp in British Columbia. Pulp Paper Mag. Can. 54, no. 7: 172, 175-6, 178 (June, 1953).

The author discusses recent efforts in British Columbia for establishing and practicing forestry. As has been the case all across America, the pulp and paper industry has been in the forefront of this development. The growing of trees has become an essential integral part of the over-all process of producing paper. The objectives of forestry (cutting at the right time, encouraging growth and reproduction, reducing losses through thinning, and eliminating or suppressing destructive agencies) are outlined. The need for research in forestry and logging methods and for the development of better public relations is emphasized. The fact must be accepted that growing trees, logging them, and delivering them to the pulp mill are part of producing paper. E.S.

BROOKES, J. D. The forestry operations of Australian Paper Manufacturers Limited. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 6-14; discussion: 14-15 (1952).

This paper gives a brief review of the afforestation activities of the company. Problems associated with eucalypt wood procurement and the estab-

lishment of pine plantations in the Gippsland area are presented, and the methods of overcoming difficulties are discussed. Details of clearing, land preparation, and fire protection are described and the main research projects outlined. E.S.

BROWN, W. G. E., LINTEAU, A., and LONG, H. D. Site classification. Pulp Paper Mag. Can. 54, no. 7: 146-8, 151-2, 155, 157 (June, 1953).

The first author describes the physiographical division of land, which takes into account soil, vegetation, and climate and identifies the various classifications by visible landforms. The second author discusses the further classification of landforms covered with vegetation (omitting trees), subdividing this field into herb and fern, herb and moss, moss, moss and dwarf shrub, peat moss and dwarf shrub, and lichen and dwarf shrub forests. The third author considers the tree vegetation along with the ground vegetation. 1 table, 1 diagram, and 6 references in the second article. R.A.S.

EDLIN, H. L. Britain's new forest villages. Unasylva 6, no. 4: 150-9 (December, 1952); Pulp Paper Mag. Can. 54, no. 7: 158, 160, 163, 165-6, 168, 170 (June, 1953).

The problem of keeping an efficient, stable, and satisfied force of workers for the reforestation projects in the sparsely-settled areas of Great Britain, particularly Wales, Scotland, and the northern counties of England, is being met by the construction of forest villages, entire communities being built by the Forestry Commission. Plans for the construction of the cottages, the layout of the communities, and the method of subsidizing the program are given. 5 illustrations. R.A.S.

SHALLCROSS, RUTH. Trends in consumption of a forest product. In Duerr, William A., and Vaux, Henry J., ed. Research in the economics of forestry. Washington, Charles Lathrop Pack Forestry Foundation, 1953, p. 418-22.

The author shows how an analysis of the trends in the consumption of pulpwood and of the influences which have shaped them can be used as a basis for estimating future trends which, in turn, should assist in the formulation of forest policies to meet anticipated needs. The necessary data, sources where they may be found, and their analysis are discussed. 8 references. E.S.

GRASSES

BHAT, R. V., and ROY, D. P. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part XII. Chemical pulps and writing and printing papers from ulla grass (*Themeda arundinacea*, Ridley). Indian Forester 79, no. 1: 25-35 (1953); *cf.* B.I.P.C. 23: 407-8.

Laboratory experiments on the chemical pulping of crushed and uncrushed ulla grass by the soda and sulfate process are described. Bleached pulps in good yields and with satisfactory strength properties were obtained. Crushing prior to chopping is desirable, because milder digesting conditions can be employed. The pulps are long-fibered, so that writing and printing papers without admixture of bamboo or sabai-grass pulps can be prepared from them. A proximate analysis shows the following composition: 54.52% Cross and Bevan cellulose, 31.48% lignin, and 22.03% pentosans. Paper

mills located in the sub-Himalayan tracts of Uttar Pradesh and in the Punjab should be able to utilize this grass (now burned to prevent forest fires) in the manufacture of paper. 5 tables, 3 references, and 2 sample sheets (one printing and one writing paper made from 100% bleached ulla-grass pulp). E.S.

GUMS AND RESINS

GRUENHUT, N. S. Mannangalactan gums—the mechanism of retention by paper fibers. Tappi 36, no. 7: 297-301 (July, 1953).

Since about 1949 mannogalactan gums have been used extensively in the paper industry as wet-end additives to permit increases in machine speed and to give added bursting strength to the finished paper. The retention of these gums and some of their borate complexes by the paper fiber is determined by a viscometric method. It is demonstrated that linear gums are retained by absorption on the fiber surface and thus are dependent upon the gum concentration, whereas highly branched or cross-linked gums are retained more securely and, within certain concentration limits, independently of the gum concentration. A theory for the mechanism of retention based on hydrogen bonding is presented. 5 tables, 4 diagrams, and 12 references. E.S.

HARD WOODS

BHAT, R. V., and JASPAL, NARENDRA S. Indigenous cellulosic raw materials for the production of pulp, paper and board. Part XIII. Chemical pulps and writing and printing papers from *Trema orientalis*, Blume. Indian Forester 79, no. 2: 69-76 (1953); *cf.* B.I.P.C. 23: 884-5.

Laboratory experiments on the production of chemical pulps by the sulfate process from the wood of *Trema Orientalis* (I) are described. (I) grows in many regions of India with the exception of very dry sites; it is a small, fast-growing, and short-lived tree. The proximate chemical analysis gives the following composition: 57.5% Cross and Bevan cellulose, 24.96% lignin, and 18.52% pentosans. Bleached pulps in 46-49.8% yield can be prepared from this wood; the fibers are short, about 1 mm. in length. The bleached pulp can be used for the manufacture of writing and printing papers in admixture with long-fibered pulps, such as bamboo or sabai grass. However, the resulting paper is not as white and bright as that of bamboo pulp alone. Two samples of paper are included in the report. One of them is a writing paper containing 75% (I) pulp and 25% bleached bamboo pulp; the other is a printing paper made from 60% (I) pulp and 40% bleached bamboo pulp. 4 tables, 2 references, and 2 paper samples. E.S.

DICKINSON, FRED E. The utilization of hardwoods in the Lake States. J. Forestry 51, no. 7: 500-3 (July, 1953).

Statistics are presented which show that about 70% of the forest resources of the Lake States consist of hardwoods. The drain on the hardwood stands, in general, has been less than the growth. Some species, such as yellow birch and sugar maple, have been overcut, whereas aspen has been increasing in volume. The pulp and paper industry offers one of the best opportunities for increased use of hardwoods. As a result of research by the Forest Products Laboratory and other investigations, the use of hardwood by the paper and board industries is continually increasing, and this trend will undoubtedly continue. 8 tables and 5 references. E.S.

HEMLOCK

DENYER, W. B. G. *Cephalosporium* canker of western hemlock. Can. J. Botany 31, no. 4: 361-6 + 1 plate (July, 1953).

A stem canker of suppressed western hemlock [*Tsuga heterophylla* (Raf.) Sarg.] was found at Powell River and Turnour Island, B.C. The canker, which appears to be annual, is irregularly elliptical with conspicuous resinosis in the early stages of development. A species of *Cephalosporium* was consistently isolated from the canker. Inoculation of western hemlock with this fungus produced cankers similar to those of natural origin. The growth and hyphal characters and the temperature-growth relations of the fungus are described. Attempts to produce the perfect stage in culture were unsuccessful. 1 table, 5 figures, and 3 references. E.S.

HISTORY

ANON. Pertinent points on paper by a forthright Victorian. Paper-Maker (London) 125, no. 6: 492 (June, 1953); Paper Market: 10 (July, 1953).

Excerpts from the writings of Benjamin Lambert in the early 1860's are given. He took out two patents on deinking and one on an improvement to the beater; in addition to his practical work, he found time to write on a great many papermaking topics. E.S.

INSECTS AND VERMIN

E. N. Protection against deterioration and preservation of paper. Allgem. Papier-Rundschau no. 7: 294 (April 2, 1953). [In German]

The author describes a method for disinfecting with carbon disulfide valuable documents or old books which have been attacked by insects, and a preservative treatment by lacquering with Zapon lacquer (nitrocellulose dissolved in amyl acetate). The lacquering procedure should not be carried out in the vicinity of an open flame; on drying, the paper is claimed to be no more combustible than prior to the treatment. E.S.

INSTRUMENTATION

THE FOXBORO COMPANY, *Foxboro, Mass.* Cost of recording, controlling, and indicating instruments. Tappi 36, no. 7: 24A, 26A, 28A (July, 1953).

A table showing the approximate cost of various types of recording, controlling, and indicating instruments commonly used in the paper industry is presented. 1 table. E.S.

THOMSON, A. G. Electronic control of variables. Paper-Maker (London) 125: 18, 28 (Mid-Summer, 1953).

An electronic temperature controller developed by Kelvin & Hughes, Ltd. is described; the instrument can also be applied to the control of any variable capable of indication by a moving-coil instrument. A brief mention is made of certain recent developments which provide much greater latitude in temperature control than the original instruments of the straight "on-off" type. E.S.

INTEGRATED FOREST UTILIZATION

HOSMER, W. ARNOLD. Integration of lumber and pulpwood use

in northeastern hardwoods. J. Forestry 51, no. 7: 491-4 (July, 1953).

The author outlines a program of integrated utilization in northeastern hardwoods started by the Brown Co., Berlin, N.H. The construction of a sawmill (which started in September, 1952) provides the facilities for processing the lumber component, whereas the rest of the log goes into pulpwood. The special problems connected with this area, such as segregation of logs, sawing methods, and marketing, are discussed, as well as other forms of integration in hardwoods and their prerequisites. Experience indicates that it takes a number of years and much hard work to develop integration into successful operation; however, the method is practicable and profitable under a variety of conditions. 2 tables. E.S.

LABORATORIES

FRANK, KARL. The modern paper laboratory; scope, layout, and equipment. Allgem. Papier-Rundschau no. 6: 248-50 (March 20, 1953). [In German]

An outline for the installation of a pulp- and paper-testing laboratory is given, including a plan for a four-room model laboratory which consists of a beater room (pulp testing), work room, dark room, and conditioned paper-testing room. The details of the individual installations are discussed. 1 floor plan. E.S.

LIGNIN

FREUDENBERG, KARL, and RASENACK, DIETRICH. *d,l*-Pinoresinol, another intermediate in the formation of lignin. Chem. Ber. 86, no. 6: 755-8 (June 30, 1953). [In German]

The action on dilute aqueous solutions of coniferyl alcohol (I) by the phenoldehydrase of edible mushrooms, and that of the redoxase (found near the cambial zone of conifers) are very similar. Immediately after (I) had disappeared from the solution, the mixture (at pH 5-6 and 20°C.) when extracted with methylene chloride gave dehydrodiconiferyl alcohol (previously reported); a new lignin intermediate, *d,l*-pinoresinol (II), melting at 111°; and small amounts of two other incompletely identified products. (II) gave a bis-dinitrophenyl ether, melting at 223-225°; a diacetate, melting at 162-164°, and a dimethyl ether (III) showing two melting points at 90-93° and 100-100.5°. The dibromide of (III) $C_{22}H_{24}O_6Br_2$ (erroneously given in the article) melts at 169-170° and again at 176-178°. The dimer (II) when heated with redoxase polymerizes to an amorphous dehydrogenation product. 1 table and 5 references. L.E.W.

MEREWETHER, J. W. T. Studies on the lignin of *Eucalyptus regnans* F. Muell. VII. The acid hydrolysis of ethanol lignin-A. Australian J. Chem. 6, no. 2: 156-61 (May, 1953).

Ethanol lignin-A from the ethanolysis of *Eucalyptus regnans* F. Muell. has been hydrolyzed with dilute hydrochloric acid with the object of ascertaining whether the combined ethoxyl is present as an acetal or as an ether. Hydrolysis with 12% hydrochloric acid was found to split off one ethoxyl group, whereas hydrolysis with 20% acid brought about complete de-ethylation. The de-ethylated ethanol lignin-A contained one carboxyl group less and two hydroxyl groups more than the original ethanol lignin-A. These results lend no support to the hypothesis that alcohol lignins are acetals and

favor the theory that the combined alkoxyl is probably present as ether. 1 table and 14 references. E.S.

MEREWETHER, J. W. T. Studies on the lignin of *Eucalyptus regnans* F. Muell. VIII. The isolation of an ether-soluble ethanol lignin. Australian J. Chem. 6, no. 2: 162-5 (May, 1953).

A second fraction, soluble in ether, has been isolated from the products of ethanolysis of *Eucalyptus regnans* F. Muell. wood meal. This fraction, designated ethanol lignin-B, has been characterized by methylation with diazomethane, acetylation, and benzoylation both of the ethanol lignin-B and its methyl derivative, and the formation of a phenylhydrazone. The analysis of these derivatives indicates that, although ethanol lignin-B is very similar to the previously described ether-insoluble ethanol lignin-A, it differs in its reaction with benzoyl chloride and with phenylhydrazone. 2 tables and 2 references. E.S.

MONNBERG, RAGNAR. Lignin studies; use of high pressure autoclaves. Paper and Timber (Finland) 35, no. 4: 189-99 (April, 1953). [In Finnish; English summary]

By treating lignin quite drastically with lime and methanol, a crystalline degradation product is formed. This is identified as pentamethyl phenol (I). On oxidation, (I) yields duroquinone (II) (*cf.* B.I.P.C. 23: 510, 529), the structure of which is shown by its synthesis from durene. The dihydro derivative of (II) bears a certain structural relationship to Vitamin E, which is discussed briefly. The main part of the article is devoted to various autoclaves used in high pressure work, for example, a 60-liter autoclave made from an old gun. In the upper portion the gun closure has been retained in a modified form. The lower opening is closed by flanges, the gun barrel being provided with a flange with protruding rings. These higher parts press into copper-filled grooves. Evidently, this is the preferred type of construction. Other autoclaves are fully illustrated in the article, including a standard one of American manufacture that takes pressures up to 5000 p.s.i. and a special autoclave used for pressures of 10,000 p.s.i., but evidently the latter gave some trouble and required modifications. The importance of safety measures, the methods of meeting them, and techniques for the formation of (I) are outlined; structural formulas are given, showing various stages of this methylation [starting with the cresols and ending with (I)] indicating that as many as 19 methylated monohydric phenols are possible. 22 figures and 11 references. L.E.W.

SOHN, A. W. Attempts to increase the phenolic character of lignin. Holzforschung 7, no. 1: 1-8 (1953). [In German; English summary]

By treating vanillin (I) in carbon tetrachloride with dry chlorine, 5-chlorovanillin was formed which, with potassium hydroxide at 170 to 200°C., gave the monomethyl ether (II) of gallic acid. Vanillic acid, in chloroform, with chlorine gave 5-chlorovanillic acid (III), which was also prepared, but less satisfactorily, by treating (I) in the dark with chlorine dioxide (care being taken to avoid explosions). The removal of chlorine from (III) by potassium hydroxide gave (II). The introduction of new chlorine groups into the aromatic nucleus was evidenced by the marked increase in the methoxyl content following methylation of (II), despite the fact that these methylated products were nonhomogeneous. Attempts were then made to chlorinate lignin, with a view toward introducing chlorine into the aromatic nucleus. The three types of lignin used were: (*a*) a desulfurized lignosulfonate, (*b*) a lignin

residue obtained from a sodium lignosulfonate, and (*c*) a methylene chloride-pre-extracted sprucewood sample which still retained native lignin. Each of (*a*), (*b*), and (*c*) was suspended in carbon tetrachloride and treated either with chlorine or chlorine dioxide. Although in all cases some chlorine was introduced into the lignin preparation, only small amounts of this entered the aromatic nucleus, as indicated by heating with potassium hydroxide followed by methylation. In other words, the percentage of newly formed phenolic hydroxyl groups was low, and the author concludes that the phenolic character of lignin could not be increased satisfactorily by these techniques. Similarly unsatisfactory results were obtained when quebracho extract or spruce-bark extract was chlorinated and treated with alkali. Here too, few new hydroxyl groups were introduced. The results do not furnish evidence that the lignin molecule is nonaromatic. This is evidenced by the fact that natural tannins of the catechol type known to contain aromatic nuclei react as sluggishly as lignin. The possible causes for this behavior are discussed. 9 tables, 1 figure, and 15 references. L.E.W.

TOWERS, G. H. N., and GIBBS, R. DARNLEY. Lignin chemistry and the taxonomy of higher plants. Nature 172, no. 4366: 25-6 (July 4, 1953).

A large number of plants were subjected to alkaline nitrobenzene oxidation, and the vanillin, syringaldehyde, and *p*-hydroxybenzaldehyde were determined by the micromethod of Stone and Blundell (*cf.* B.I.P.C. 21: 689-90). Qualitative results indicate that *p*-hydrobenzaldehyde is far from restricted in its occurrence. It was found in *Psilotum,* in several lycopsids, in *Equisetum,* in a fern, in a cycad, in several conifers, and in all the monocotyledons examined. It appears to be absent in general from dicotyledons (although there was an exception, *Tetracentron sinense*). Syringaldehyde-vanillin ratios roughly paralleled the intensity of the Mäule test. The significance of these findings on taxonomic classification is discussed along with correlation with other color reaction of the plants. 2 tables and 16 references. I.A.P.

WACEK, A., and LIMONTSCHEW, W. Oxidation experiments with several methanol and ethanol lignins obtained from sprucewood. Monatsh. Chem. 84, no. 3: 453-60 (June 15, 1953). [In German]

Ethanol lignin (prepared by the method of Cramer and co-workers, *cf.* B.I.P.C. 9: 296) was methylated with dimethyl sulfate, and a methanol lignin was acetylated with acetic anhydride in pyridine. Each of the resulting products (I) was then oxidized with a mixture of acetic and chromic acid; the fractionation of the oxidation products from (I) is shown in an extensive flow chart. The oxidation products after removal of acids and saponification gave largely vanillic acid, a finding which apparently argues in favor of cumarone systems in sprucewood lignin, inasmuch as chromic acid oxidation of a substituted cumarone causes fission of the furan ring with the formation of an ester of an *o*-hydroxyketone. 2 tables and 11 references. L.E.W.

LIGNIN—MICROBIOLOGICAL DEGRADATION

PRATT, YOLANDA T., KONETZKA, WALTER A., PELCZAR, MICHAEL J., JR., and MARTIN, WALTER H. Biological degradation of lignin. V. Polysaccharide synthesis from *alpha*-conidendrin. Appl. Microbiol. 1, no. 4: 171-4 (July, 1953); *cf.* B.I.P.C. 23: 557.

The present investigation concerns the isolation and characterization of a polysaccharide synthesized by the *Flavobacterium sp.* (I) when grown in a medium containing α-conidendrin or vanillic acid as a sole carbon source. (I) was found capable of synthesizing a polysaccharide or mixture of poly-

saccharides under these conditions. The polysaccharide hydrolyzate consists of D-galactose, D-glucose, D-mannose, D-ribose, and L-rhamnose as determined by paper chromatography. (I) has the unique characteristic of growing luxuriantly at the expense of the compounds α-conidendrin and vanillic acid, whereas little if any growth occurs when the conventional types of carbon sources are employed. 3 figures and 6 references. E.S.

MACHINERY—BOARD MACHINES

BREYFOGLE, HOWARD. High speed liner board. Paper Mill News 76, no. 25: 138, 140 (June 20, 1953); Southern Pulp Paper Mfr. 16, no. 8: 54-5, 57 (August, 1953).

The author describes briefly the construction and some of the operating features of the seven-cylinder board machine installed by the Alton Box Board Co. in 1947 (*cf.* B.I.P.C. 18: 300-1). In trial runs, the machine has performed at 700 f.p.m.; however, speeds of 500 to 600 f.p.m., at which customer specifications can be met, are considered the most suitable. E.S.

MACHINERY—CHIPPERS

BRYCE, P. B. Chip room operation at Burnie Pulp and Paper Mills. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 16-22; discussion: 23 (1952).

The design and behavior of Wigger chippers (manufactured by Heinrich Wigger and Company of Unna, Westfalen, Germany) at the Burnie Mill of Associated Pulp and Paper Mills Limited is described in chipping eucalypt and myrtle-beechwoods for pulp and fuel. I table and 6 figures. E.S.

MACHINERY—CONVERTING MACHINERY

TRUNCK, E. J. Versatile print-sheet-cut operation. Boxboard Containers 71, no. 727: 20-2 (July, 1953).

Intercity Box and Paper Co., Freeport, Ill. is employing web-fed aniline printing with a Wolverine Hydro-Printer equipped with three color units, a 52-inch, heavy-duty Hamblet sheeter equipped with an electric eye for accurately sheeting preprinted rolls, and a 65-inch Miehle cutting-creasing press. This equipment can print and sheet on the average of 10 tons of board/nine-hour day for its folding-carton operations. It will also produce box wraps in rewound rolls for the setup paper-box division and, in addition, print kraft paper for conversion into wrapping paper and paper bags. The equipment and operations are outlined briefly. 6 illustrations. R.A.S.

MACHINERY—DIRECTORIES

PAPER TRADE JOURNAL. Who's who among your suppliers. Paper Trade J. 136, no. 25: 91-304 (interspersed with advertisements) (June 19, 1953).

A second enlarged and revised edition of this directory is presented in six sections: (1) pulp and paper manufacturing machinery and equipment; (2) converting machinery and equipment; (3) process and service equipment; (4) materials, chemicals used in manufacture or conversion; (5) operating supplies; and (6) services. Under the name of each company the sales representatives are listed, including very brief biographies and, in most cases, also portraits. E.S.

MACHINERY—ELECTRIC EQUIPMENT

O'CONNELL, R. F. Accidents to electrical equipment. Pulp Paper Mag. Can. 54, no. 7: 119-20 (June, 1953).

The failure of a piece of electrical equipment is usually caused by old age, faulty design or materials, negligence and abuse, lack of care and attention or maintenance, or accidental causes. The most economical way to use electrical equipment is to buy the right equipment, see that it is well installed and properly protected, and then make sure that it is kept clean, that connections are kept tight, that worn bearings are renewed, and that all parts are inspected regularly and necessary repairs are made. R.A.S.

MACHINERY—FELTS

BHARGAVA, KESHAB D. Handling and care of press felts. Indian Pulp and Paper 7, no. 10: 478-83 (April, 1953).

The author discusses the factors which adversely affect the life of press felts on the paper machine and gives directions for their correct installation, operation, and maintenance, including washing. The problem of felt life is of particular importance in India with no domestic felt industry; all felts have to be imported. E.S.

MACHINERY—HEAT EXCHANGERS

HALTER, G. E. Heat exchangers; maintenance and reconditioning. Paper-Maker (London) 125: 20-4, 28 (Mid-Summer, 1953).

The author discusses the maintenance of various types of shell-and-tube heat exchangers and jacketed equipment; steam, chemical, and mechanical cleaning; constructional materials; care and maintenance of tools employed in reconditioning; and special applications. E.S.

MACHINERY—HOODS

CHALMERS, G. J. The Ross-Hooper enclosed-type paper machine hood. Paper Mill News 76, no. 25: 115-16, 120, 122, 181 (June 20, 1953).

The successful installation of a Ross-Hooper hood (I) totally enclosing the drier section of a high-speed newsprint machine (*cf.* B.I.P.C. 23: 587-8) may be considered the most significant development in the drying process on the paper machine in the last decade. The construction and operation of (I) are outlined, with particular reference to the factors which influenced the design (maximum accessibility, prevention of leakage to machine room, and complete ventilation of all pockets). The advantages of the new hood include reduced exhaust and supply volumes, steam consumption, and drier-steam pressure, and improved moisture distribution at the reel, machine efficiency, and machine-room working conditions. 4 illustrations and 3 references. E.S.

MACHINERY—PIPING

MAJEWSKI, Z. J. A mathematical treatment of the frictional losses due to flow of stock. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 180-200; discussion: 200-3 (1952).

The analysis of Brecht and Heller's work (*cf.* B.I.P.C. 21: 96) enables an algebraic formula for head loss caused by flow of stock in pipes to be derived. This formula is valid up to the velocity where the so far unex-

plained inflection in head-loss curves occurs. Three coefficients characterize the head loss of a certain stock. The coefficients for seven different stocks investigated by Brecht and Heller are given. For unbleached sulfite the change in value of the coefficients is followed over a wide range of freeness. A critical comparison indicates that the well-known TAPPI curves for sulfite stock, which give much higher head losses than those of Brecht and Heller, were determined for stock of a very low freeness. In the second part of the paper, the costs of all items of a pumping system and of the power consumed are expressed in algebraic form; one differentiation of that equation enables the determination of the velocity of flow for stock of given stock concentration, for which the total costs are a minimum. There are indications that stock, particularly that of high concentration, should be pumped at a smaller velocity than it is usually assumed. Another differentiation allows the determination of the most economical concentration as well as velocity for pumping stock. 1 table, 12 figures, and 4 references. E.S.

MACHINERY—PRESSES

SUTHERST, T. Modern press assemblies incorporating suction pick-up. Papier, carton et cellulose 2, no. 2: 53-8, 61-4 (May-June, 1953). [In French] *cf.* B.I.P.C. 22: 112-13.

This is a complete French translation of the English original. 1 table and 30 figures. E.S.

MACHINERY—SAVE-ALLS

SCHMIDT, GERHARD. The mode of operation of a Savalla saveall in mill practice. Das Papier 7, no. 11/12: 190-5 (June, 1953). [In German]

The Savalla saveall (I) is a vacuum flotation saveall, a modification and further development of the well-known Adka saveall. Following a brief description of its construction, the physicochemical processes (flotation) and the characteristic flow and separation of the white water in (I) are analyzed, with particular emphasis on their influence upon fiber recovery (II). The data are based on the experience gained with a recent installation on a fine-paper machine of the Reflex-Papier-Fabrik Felix Heinr. Schoeller in Düren, where straw pulp is used as part of the furnish. The yield of (II) was found to depend upon variations of the machine white water (III) fed to (I), additions of spray water, and vacuum. The concentration of suspended matter in (III) depends upon paper grade (freeness, fillers, etc.) and possible additions of couch broke and cut-squirt trim. To keep (III) as uniform as possible, couch-broke additions were preferably omitted; the more uniform the concentration of (III) was kept, the more uniform and higher the resulting (II) was found to be. Five different flotation agents were tried; for the special conditions of the present investigations rosin soap was found the most effective. It acted on fibers and fillers and was in addition the least expensive of all. It is pointed out that flotation not only depends upon agents, but also on the type of fiber. Sulfite pulp flotates more readily than sulfate pulp and the latter, in turn, better than straw pulp. The presence of straw pulp in the furnish is held responsible for the original flotation difficulties which this mill experienced after the installation of (I). 2 tables, 5 figures, and 5 footnotes. E.S.

MACHINERY—SCREENS

STARBORG, EGON. The screening of groundwood pulp. Svensk Papperstidn. 56, no. 11: 412-14 (June 15, 1953). [In Swedish]

Nearly every groundwood mill uses a different combination of coarse and fine screening stages for the removal of slivers and shims; not only in mills making different grades of paper and board, but even in newsprint mills the opinions concerning the most efficient installations and arrangement of the units vary a good deal. The author shows the influence of wood quality from different sites on screening; the wood from northern parts of Sweden is much easier to screen and gives far less tailings than that from the middle or southern sections of the country. The frequency of sharpening the pulpstones, the number of stones employed, and the desired freeness will influence the amount of slivers produced. The final utilization of the tailings (as raw material for another purpose or returned to the groundwood system after refining) will also have a bearing on the installation of the screens. In conclusion, three layouts of screen rooms in three different Swedish newsprint mills are described, using 75, 110-120, and 270 tons of groundwood/24 hours, respectively, corresponding to freenesses of 95, 100, and 155 cc. The screenings are refined and returned to the groundwood system in each case. 3 flowsheets. E.S.

MACHINERY—SLITTERS AND WINDERS

JACOBS, ROBERT J. Continuous unwinding equipment. Parts I and II. Am. Paper Converter 27, no. 5: 17-23; no. 6: 18-24 (May, June, 1953).

The author discusses and illustrates a wide variety of continuous unwinders, their limitations, and proper applications. The basic factors that influence the selection of continuous unwinding equipment with regard to mechanical performance are the types of web being unwound; tensile strength, caliper, and width of the web; diameter of the new roll; speed of operation and and speed desired for making the splice; subsequent operations; and the requirement of tension or register control. Examples given include double-unwind stands in fixed position, with auxiliary arms, in a single loading position, of the sliding-bearing type, with pressure roller and cutoff, with pressure roller, speed-up roller, and cutoff, and with "J" box and sewed splice; two-position unwind stands; rotating-stand types with two arms, with splicing drum, with butt splicer, with belt splicing, and with belt tension and flying splicer; combination reels; and multiple stands on a turntable. 57 figures. R.A.S.

MACHINERY—TANKS

PLUMMER, FRED L. New cost data—field-erected storage tanks. Tappi 36, no. 7: 14A, 16A, 18A, 20A, 22A, 24A (July, 1953).

The storage of fluid is often a major problem in the process industries, and the cost of storage facilities frequently represents a rather large portion of the capital investment. The author describes several types of storage tanks and presents charts showing installed costs, including the cost of materials, fabrication, and erection of the tanks assuming average values for transportation, field labor, insurance, and tax costs and based on rates in effect during the first quarter of 1952. The article was originally published in *Chemical Engineering Costs Quarterly* for July, 1952. 13 figures and 10 references. E.S.

MACHINERY—WEB TRANSFER

ELY, D. A. Vacuum transfer from wire to press section. Paper Trade J. 136, no. 26: 18-19 (June 26, 1953); *cf.* B.I.P.C. 23: 374.

One of the recent Beloit installations of a vacuum transfer arrangement for carrying a lightweight sheet from the Fourdrinier wire to the presses

in combination with a transfer press and Cloverleaf press at the Roanoke mill of Halifax Paper Co. is described. 3 illustrations. E.S.

MATERIALS HANDLING

GOODMAN, L. LANDON. Handling—the new technology. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 30, no. 3: 78-82 (June, 1953). [Abridgment]

The author considers materials handling the only field which will yield the important increase in productivity required in British industry. He stresses that, in manufacture, handling cannot be considered without processing or vice versa and discusses a number of pitfalls to be avoided in the application of good handling. Particular attention is paid to the problems of the small and medium-sized plant. E.S.

KRAFT, —. The rationalization in materials handling helps the paper-converting industry. Allgem. Papier-Rundschau no. 6: 251-3 (March 20, 1953). [In German]

The advantages of streamlined mechanized handling in general and suitable equipment for plants of small size are discussed. 5 illustrations and 3 references. E.S.

SMYTH, F. G. The pneumatic handling of groundwood pulp. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 24-8; discussion: 28-9 (1952).

A method is described for blowing pulp (in excess of immediate requirements) with a moisture content of about 75% into storage and returning it to the production circuit by the use of a fork-lift truck which digs into the stock pile and carries the pulp in a shovel attachment to the breaker beaters. E.S.

METERS AND RECORDERS

LANDESMAN, A. L. Flow measurement and control in pulp & paper mills. Paper Mill News 76, no. 25: 126, 128, 131, 135 (June 20, 1953).

The author discusses different applications of flow-rate meters in pulp and paper mills, particularly in the sulfite mill. 4 references. E.S.

MICROSCOPY

JAYME, G., and HARDERS-STEINHÄUSER, M. The freezing microtome as an aid to the chemical analysis of paper. Paper-Maker (London) 125: 30, 32-4, 36 (Mid-Summer, 1953); *cf.* B.I.P.C. 23: 491.

This article is a complete English translation of the previous German article. 12 figures and 3 references. E.S.

MILL MANAGEMENT

COLE, EDWIN J. The technologist in industry. Part I. The technologist in the paper industry. Parts II-III. Paper-Maker (London) 125, no. 2: 110; no. 4: 290, 292; no. 5: 397 (February, April, May, 1953).

In Part I, the position of the technologist (a graduate student or one who performs work of a graduate status as differentiated from "technician") in the industry in general is reviewed. The second part deals with the position and work of a technologist in the paper industry, and an attempt is made to describe the organization and operation of a technical mill department. In the last article the operation of a research group in a large organization is outlined. 1 chart. E.S.

MORTENSON, A. O. Planning & scheduling repair, maintenance, and construction work. Paper Mill News 76, no. 25: 108, 110, 140 (June 20, 1953); Southern Pulp Paper Mfr. 16, no. 8: 32, 34-5 (August, 1953).

Planning and scheduling is essential to a good repair and maintenance program; with modern high-speed production techniques it is realized that maintenance efficiency can make or break a company. The author gives an outline of such a program with suggestions for forms and reports which can be developed into a system suitable for individual mill conditions. E.S.

RUTT, A. HUGH. Current reflections. The future boss. Tech. Bull. Tech. Sect., Brit. Paper and Board Makers' Assoc. 30, no. 2: 37-8 (April, 1953).

The man selected to handle all the ramifications of a paper mill as a top-ranking executive should not be a specialist in one subject, but should have some knowledge of all sciences, i.e., have a sound, all-around education. To be 100% successful, he must possess two qualities—personality and courage. It is possible that at present too much reliance is placed on the highly-trained specialist and too little opportunity offered to the ordinary man for achieving positions which were open to him in the past. E.S.

NEWSPRINT—STATISTICS

AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION. Newsprint consumption by states—1952. Newsprint Service Bur. Bull. no. 422: 6 (March, 1953); *cf.* B.I.P.C. 22: 591.

Based on reports submitted by 1460 daily newspapers, the annual consumption of newsprint in the different states amounted to 5,155,408 tons or 86.1% of the estimated total consumption. New York State led with 914,932 tons; Nevada with 1909 tons and Wyoming with 1962 tons showed the lowest consumption figures. 1 table. E.S.

ZIMA, J. J. World production and distribution of newsprint paper —1951. Newsprint Service Bur. Bull. no. 418: 2-3, 5-11 (November, 1952); *cf.* B.I.P.C. 22: 260.

The present data were compiled in co-operation with the Pulp, Paper and Paperboard Division of the National Production Authority, U. S. Department of Commerce. They show that the countries of the world outside the Communist areas produced in 1951 in excess of 9.5 million tons of newsprint. Except for declines in production in the United Kingdom, Germany, Belgium, and Yugoslavia, the output in all other countries was equal to or higher than that in 1950. About six countries accounted for 98% of known world exports; in order of importance these were: Canada, Finland, Sweden, Norway, the United Kingdom, and the United States. Canadian exports attained a peak volume of 5,112,000 tons, of which 93.4% went to the United States. Production and distribution data for the different continents and

countries are given, with estimated values for the countries under the dominance of Russia. It is, however, pointed out that the figures for the Communist areas may contain an appreciable margin of error and should be considered in that light. 13 tables. E.S.

ORGANOLEPTIC TESTING

PAINE, F. A. Detection of odour in packages. PATRA News, *Packaging Div.* no. 30: 1-2 (May, 1953).

PATRA has developed a technique for examining the constituents of a package to ascertain those responsible for giving off a foreign odor; the technique is based on the principle of odor fatigue. The complaint package and each of its constituents are placed separately in clean odor-free glass jars or tins, with or without the addition of a few drops of distilled water; the jars are closed and left standing for a certain period, usually overnight. The observer is asked the next morning to smell the complaint package first and then the odor from one particular component until it has apparently disappeared or become very faint. Before the fatigue effect has time to wear off, the observer is again asked to smell the odor from the complaint package. If he is no longer able to detect any odor, the chances are very high in favor of the component under examination having caused the complaint. If the answer is still in the affirmative, there are two possibilities. If the odor is still the same as before, the complaint is not caused by the component used for producing fatigue. If, however, the odor is found different, the indications are that part of the odor present in the complaint is due to the component under investigation and that one or more of the other constituents cause the remainder. E.S.

PACKAGING

ANON. Pairing solves the problem. Chem. Week 73, no. 3: 74, 76, 79 (July 18, 1953).

Reference is made to polyethylene-cellophane films laminated without the use of adhesives (trade names Cellothene and Polycel) which combine the best features of the component sheets without danger of delamination on aging or at high temperatures. The films are used for packaging frozen fruit juices, foods, cosmetics, medicines, etc. in single-service units. 2 illustrations. E.S.

ANON. Push-up is push-over for sherbet. Packaging Parade 21, no. 246: 48-50 (July, 1953).

A cylindrical package for sherbet consists of a spiral-wound paperboard tube and two paperboard disks, to one of which is attached a wooden stick held in tight position in the center by a metal ring. The disk attached to the stick pushes the sherbet out through the top of the container. The use of this package has been advanced by the development of the "sherbet-tube filling machine" by the Clybourn Machine Corporation. 8 illustrations. R.A.S.

BAKER BRUSH COMPANY, *New York.* Open for inspection. Modern Packaging 26, no. 11: 98-9 (July, 1953).

Paint brushes are now wrapped in colorfully printed paper envelopes which have both flap and envelope precoated with a strip of pressure-sensitive adhesive using a special latex, which permits the flap to be sealed, lifted, and resealed any number of times. 5 illustrations. R.A.S.

LYON METAL PRODUCTS INCORPORATED, *Aurora, Ill.* Take the

case of a kitchen cabinet. Packaging Parade 21, no. 246: 100-2 (July, 1953).

To insure packaging of maximum simplicity and efficiency, the company uses the following aids: a packaging-material locating system, consisting of a circular card file indexed to carton numbers and product catalog numbers; a method of rack storage; and a set of instructions, geared to the numbering systems used for materials, written for the typical line worker. Lyon's current kitchen-cabinet packaging procedures in a floating-carton type of corrugated box and inner packing are described. 7 illustrations.

R.A.S.

MARTIN, JOHN W. Meat retailers note trend toward boxes. Am. Boxmaker 42, no. 7: 9-11 (July, 1953).

Kroger Food Stores, Inc. is currently experimenting with folding cartons for prepackaging meat for self-service merchandising. Certain cuts of meat are packaged in cartons which are made of 20-point solid sulfite bleached board, wax saturated, with windows of 300 MSAT cellophane for fresh meats and 300 LSAT-80 for cured meats. The carton is reported to have advantages of a more attractive appearance, greater protection against spoilage, greater ease in storing, and the ability to stand more abuse than the transparent film packages. 3 illustrations. R.A.S.

MODERN PACKAGING. The rack jobber's viewpoint. Modern Packaging 26, no. 11: 81-7, 178 (July, 1953).

The special packaging problems of nonfood products in supermarkets are discussed. The packaging committee of the American Rack Merchandisers Institute has drawn up a list for planning such packages which include the following basic requirements: the package should be compact, easy to stack and display; transparent, if possible; pilferproof; colorful and eye appealing; clean and sanitary; easy to open and to reclose, if for more than a one-time use; adaptable to re-use; ample in its protection against damage; and contain complete product information with regard to size, weight, count, and ways to use the product. 23 illustrations. R.A.S.

MODERN PACKAGING. Sunsweet dried fruits. Modern Packaging 26, no. 11: 92-7, 185-6 (July, 1953).

The history and development of California's dried-fruit industry and the important part which packaging played in this development are described. Sunsweet helped to develop the "triple-sealed" dried-fruit carton, which embodies a glassine interliner, a chipboard carton shell, and a printed paper wrap glued to the carton shell. With the discovery of the "Tenderizing" process the outer layer was replaced by an aluminum-foil-laminated paper. The company also pioneered the use of saran-coated cellophane for bagged fruit (*cf.* B.I.P.C. 21: 614). 18 illustrations. R.A.S.

PAPER—COATED

GEESE, CHARLES F. Offset inks and paper surfaces. Natl. Lithographer 60, no. 7: 41 (July, 1953).

The author emphasizes the importance of offset paper surfaces suited for the purpose, i.e., free from lint and coatings that do not pile on the blanket; in addition, such paper should be as near neutral in acid or alkalinity content as possible. He also points out that machine-coated letterpress paper is less costly than machine-coated paper for offset. To run letterpress-coated paper

on an offset press is possible, and some shops are doing it with success. Although it slows down production, it still costs less than the use of litho sheets. E.S.

STAR PAPER SALES LTD. Machine coated papers. Paper Making and Paper Selling 72, no. 1: 12-15, 17-19 (Spring, 1953).

The manufacture of machine-coated paper at Star Paper Mills Ltd. by the Massey process is described by means of 12 illustrations. R.A.S.

PAPER—CONVERSION

ANON. Norman Baize goes back to school. Am. Paper Converter 27, no. 7: 17-19 (July, 1953).

The curriculum of the school for bagmakers of the Roto Bag Machine Corp., New York is described, and the activities of the school are illustrated by following one of the students through the two weeks of intensive study. 15 illustrations. R.A.S.

MARTIN, JOHN W. Production control for the envelope manufacturer. Am. Paper Converter 27, no. 6: 15-17 (June, 1953).

The buildings and equipment, system of production control, and various auxiliary departments, including a boxmaking plant and a machine shop with a scrap-paper baler for separating and grading waste paper, at the Garden City Envelope Co., Chicago, are described. R.A.S.

PAPER—DEFECTS

BHARGAVA, KESHAB D. Two-sidedness of paper. Indian Pulp and Paper 7, no. 11: 525-6 (May, 1953).

The causes of structural and color two-sidedness of paper and possible remedies are discussed. E.S.

PAPER—MERCHANDISING

CANFIELD, CHARLES. How good are the best printing papers? Paper Trade J. 136, no. 26: 23-4, 26-7 (June 26, 1953).

The author discusses the problems of the paper merchant, particularly the fact that trouble shooting bad printing runs has become the daily task of many of them. Lithography accounts for most of the complaints; no matter whether the ink, press adjustment, poor copy on poor plates, or inferior paper is the cause of unsatisfactory printing, paper is always involved and takes the blame. The lack of definitions of "perfection" and the apparent impossibility of combining mass production and perfection throughout all operations must be realized. As a possible solution, a better mutual understanding of the problems of lithographers, merchants, and mills is recommended; this might be accomplished by a meeting of responsible representatives of these groups. E.S.

PAPER—VISCO-ELASTICITY

ANDERSSON, OLLE. Paper as a visco-elastic body. VI. An impulse method for measuring the impact strength of paper. Svensk Papperstidn. 56, no. 11: 403-11 (June 15, 1953). [In English; German and Swedish summaries] *cf.* B.I.P.C. 20: 501-2.

The response of paper to shock loading has been investigated theoretically,

and possible methods for determining the stress-strain characteristics, including the rupture energy, are discussed. A new concept is presented, involving the measurement of the momentum or impulse transmitted through a test sample. An instrument for measuring this quantity is described, and the variations of the impulse under different testing conditions are discussed. The influence of mechanical pretreatments of the sample was studied. A comparison of the impulse measurements and practical strength figures obtained from drop tests carried out with paper sacks indicates that impulse tests have a higher correlation with service strength than the results of the classical tests. 4 tables, 11 figures, and 2 references. E.S.

PAPER AND PULP INDUSTRY

SCHWEISHEIMER, W. Paper and pulp industry in the United States and Canada. Paper Making and Paper Selling 72, no. 1: 9-10 (Spring, 1953).

A brief review of new developments in the pulp and paper industry is given; developments mentioned include the construction of a pilot plant at Camas, Wash., the installation of modern instrumentation, all-glass paper, economics of sulfite waste liquor, and "population equivalents" of paper mill wastes. R.A.S.

TURNER, JOHN S. Milestones 1903-1912. Pulp Paper Mag. Can. 54, no. 7: 102-10 (June, 1953).

This is the first in a series of articles giving the highlights in the 50-year history of the Canadian pulp and paper industry covered by the *Pulp and Paper Magazine of Canada.* The five installments each cover a ten-year period. 14 illustrations of Canadian mills. R.A.S.

PAPER AND PULP INDUSTRY—EDUCATION

ANON. The inauguration of the semicommercial station Pavillon Marcel Deléon. Rev. papiers et cartons 16, no. 10: 4-6, 8-12, 15 (May 15, 1953); Papeterie 75, no. 5: 307, 309, 311, 313, 315, 317, 319-21, 323, 325, 327 (May, 1953). [In French]

The inauguration ceremonies of a new semicommercial station dedicated on April 13, 1953 at the papermaking school of Grenoble are described in detail. 3 illustrations. E.S.

HUMPHRIES, JAMES. A review of education for the paper industry in Great Britain. Paper-Maker (London) 125: 44, 48 (Mid-Summer, 1953).

The author discusses the educational possibilities existing in Great Britain for the two types of established personnel (fairly well educated and primary educated men) in a paper mill and offers constructive criticism for improving the classes leading to the City and Guilds Intermediate and Final Examinations. The part which technical journals could play in assisting the cause of education by publishing lectures on more advanced literature is pointed out. Suggestions are also given for improving the only full-time course in the technology of paper at the University of Manchester by extending it from three to four years, with the first three years spent on fundamental studies, and the fourth year reserved for high-level papermaking lectures and concentrated laboratory work. E.S.

MUSSBACH, KURT, SCHMIDT, ERHARD, and SCHMIDT, RUDOLF.

The development in the foreign paper trade of Germany. Parts I-III. Allgem. Papier-Rundschau no. 6: 233-6, 238-43 (March 20, 1953). [In German]

The first author discusses German imports of papermaking raw materials, paper, and board in 1952; the second author deals with exports of the pulp and paper industry for the same period, and the third author covers converted paper and board products, including graphic arts, as well as the general foreign-trade situation in these commodities. Detailed statistical data are included. 16 tables. E.S.

PAPER AND PULP INDUSTRY—PUBLIC RELATIONS

MACKENZIE, N. A. M. A citizen looks at industry. Pulp Paper Mag. Can. 54, no. 7: 111-12 (June, 1953).

The author points out how the problems of public relations and strikes which occur on failure to solve them, affect the public, as well as the workers and management. Personal qualifications for both workers and managers are given; a psychological explanation for the attitudes of each side is offered. R.A.S.

ROCHESTER, D. M. What the community relations program means to employee and employer. Paper Mill News 76, no. 25: 100, 112 (June 20, 1953); Southern Pulp Paper Mfr. 16, no. 7: 97-100 (July, 1953).

The author describes the community relations project of the American Pulp and Paper Association which is now two years old, its activities, purpose, and accomplishments to date. E.S.

PAPER AND PULP MILLS

ANON. Billeruds Aktiebolag 70 years old. Svensk Papperstidn. 56, no. 12: 462-7 (June 30, 1953). [In Swedish]

A brief account of the assets of the corporation is given, supplemented by one map and 17 illustrations of different units. E.S.

ANON. A brief history of some British paper mills, from published notes, also paper mill machinery and raw material manufacturers. Paper Making and Paper Selling 72, no. 1: 21-34 (Spring, 1953).

Brief histories are given of 44 British paper mills, paper mill machinery manufacturers, and raw material manufacturers. R.A.S.

ANON. Products of the forest. Rohm & Haas Reptr. 11, no. 3: 14-19 (May-June, 1953).

Some of the operations of the Brown Company, Berlin, N.H., and its subsidiary at La Tuque, Canada, are described. Tree species used as raw materials, products which the company manufactures (bleached and unbleached wood pulp, as well as paper products), descriptions of the company's various machines and their operation, and the program for forest conservation are given. 6 illustrations. R.A.S.

ANON. W. Rosenlew & Co., A.B. 100 years. Finnish Paper and Timber 4, no. 1: 6-7 (February, 1953). [In English]

A brief outline is given of the history of the Finnish company which exports sawn goods, kraft paper, sulfate and sulfite pulp, prefabricated houses, boxboards, and machinery. Since 1929 the spent sulfite liquor of the Pori (Björneborg) sulfite mill has been processed into bakers' yeast; as far as known, the yeast factory is the only one of its kind in Europe. 3 illustrations. E.S.

OLIVER & BOYD, *Edinburgh,* and WEIR, ROBERT. Paper mills in Scotland in 1832. Paper-Maker (London) 125, no. 5: 372, 374 (May, 1953).

A list of paper mills situated in Scotland originally issued in April, 1832 and reprinted in the May, 1915 issue of the *Paper-Maker* is presented. 1 table. E.S.

PAPER BREAKS

WILLIAMS, D. J. Photoelectric break detectors for paper and board machines. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 41-8; discussion: 48-50 (1952).

Photoelectric relays have been used with success as break detectors on paper and board machines; detailed circuits are given. In paper-machine installations the light sources and photocells are so mounted that the light beam strikes the sheet just inside the front edge, thereby affording protection for the tail. The units are mounted at intervals throughout the drier sections, and on the paper machine the sheet is cut automatically at the suction couch in the event of a break. An audible alarm is also sounded and, if desired, a new tail may be cut simultaneously. Warning lights at each unit indicate the position of the break, and provision is made on the machine at the Maryvale mill for inspecting the tail as it is being fed through the first two drier sections after a break. The board-machine installations do not incorporate sheet-breaking or tail-forming devices, since it is customary to make the tail at the location of the break. The system used on these machines permits individual resetting of relays, which has the advantage of automatically protecting the sheet behind the break, irrespective of where the break occurs. Periodic maintenance of the units is necessary, particular attention being given to relay contacts. Very little trouble has been experienced with faulty valves, although the units are in continuous service. Spare units are maintained, and replacement can be effected on the run without upsetting the operation of the rest of the system. 5 figures. E.S.

PAPER SIZING

GORHAM, J. F., and THODE, E. F. Surface properties of rosin size precipitate. II. Effect of foreign ions on the electrophoretic mobility of rosin-aluminum sulphate complex. Tappi 36, no. 7: 315-19 (July, 1953).

An investigation to determine the effect of foreign ions on the net surface potential of the rosin-aluminum sulfate precipitate has been carried out by means of electrophoretic measurements. It was found that the presence of sufficient alkaline-earth sulfates tends to decrease the mobility of the rosin-aluminum sulfate complex; the decrease in mobility of the complex is proportional to the concentration of foreign sulfate below 0.1 *M*. This decrease correlates with a decrease noted in sizing effectiveness upon addition of foreign sulfates to size systems. In the case of foreign chlorides it was found that the mobility of the complex increases in the presence of many metallic chlorides, within an upper concentration limit of 0.004 *M* in

most cases. Within appropriate limits, the mobility is a logarithmic function of the foreign cation concentration. The mathematical expression of this function has the general form: $d\mu/dC = K/C$, where μ is the electrophoretic mobility, C is the concentration of the foreign ion, and K is an empirical constant evaluated for a given ion. This function is similar in form to an equation for ion absorption derivable from the Nernst half-cell concentration-potential theory. As a result of such similarity, it is tentatively concluded that the variation in mobility noted in the case of addition of metallic chlorides is caused, in part, by the preferential adsorption of the foreign cation on the rosin-aluminum sulfate complex. Experiments with the addition of sodium salts of some high-valence anions, which have been found to have a drastically adverse effect on sizing, demonstrate that such materials also bring about a rapid drop in the electrophoretic mobility of the size precipitate. As the concentration of the foreign anion increases, the positive charge on the size precipitate drops rapidly and soon becomes negative. These results lend further credence to an electrostatic theory of sizing. 1 table, 8 diagrams, and 6 references. E.S.

PAVLIN, R. J. Stearato chromic chloride as a sizing agent for paper. Tappi 36, no. 7: 107-11A (July, 1953).

A new water-soluble sizing agent (trade name Quilon) (I), an isopropanol solution of stearato chromic chloride with a small amount of water present (*cf.* U. S. patent 2,273,040 [Feb. 17, 1942]), and its chemical composition are described. It can be applied from water solutions to surfaces containing polar groups and, after heating, a chemical reaction takes place with the development of water repellency or water resistance. (I) is not recommended for addition to the beater or headbox, but surface treatment on the paper machine or with off-machine equipment can be easily accomplished. Water-resistant properties are developed on most types and varieties of paper without adversely affecting appearance, strength, or texture. Exceptional water resistance and wet-strength properties can be achieved on papers to which high wet-strength resins have been added in the beater. The sizing properties of (I) are nonfugitive and not adversely affected by general aging conditions. (I) is compatible with many of the conventional tub-sizing agents, such as starches or glue; it is not compatible with alkaline starches, casein, sodium alginate, sodium carboxymethylcellulose, or complex phosphates. (I) can also be used for the development of release characteristics on paper (antisticks) and as an insolubilizing agent for water-sensitive adhesives or coatings. 1 table and 3 figures. E.S.

REID, H. A. Yacca resin; its use as a paper sizing agent. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 231-9; discussion: 239-42 (1952).

Yacca resin is obtained from various species of *Xanthorrhoea,* a plant widespread in the southern parts of Australia. Methods of recovering the resin and its main physical properties are described. A size solution is formed by dissolving the resin in cold sodium hydroxide solution. This size reacts with alum to size paper, and is about 80% as effective, on a dissolved-solids basis, as is rosin size in conferring water-resistant properties to the paper. Although the price of yacca resin has risen fourfold since 1945, it is still slightly cheaper as a sizing agent than rosin. Because of its dark color, however, its use is restricted to those papers (such as kraft wrapping paper) where color is not important. Since yacca resin differs both chemically and physically from ordinary rosin, optimum sizing and machine-operating conditions may differ from those required when using rosin size. 2 tables and 4 references. E.S.

THODE, E. F., GORHAM, J. F., and ATWOOD, R. H. Surface properties of rosin size precipitate. I. Factors affecting formation of rosin-aluminum sulphate complex. Tappi 36, no. 7: 310-14 (July, 1953).

Results of electrophoretic mobility determinations on the rosin-aluminum sulfate complex are presented as a means of evaluating factors affecting the surface potential of size precipitate. In the absence of foreign materials, the original negative potential of rosin is found to change rapidly to a positive value with the addition of small amounts of aluminum sulfate. At about a 1:1 ratio of aluminum sulfate (anhydrous) to rosin size a maximum positive value is obtained. A subsequent hundred-fold increase in aluminum sulfate concentration has very little effect on this value. A comparison of complex suspensions that have been subjected to violent agitation with those not so treated indicates that, in the absence of foreign materials, the net potential of the rosin-aluminum sulfate complex is decreased by such agitation. A hypothetical explanation of this phenomenon, based on the possibility of ion entrapment, is presented. The correlation of mobility results with a limited amount of data on controlled sizing experiments indicates a substantial agreement with the theory that the attraction of unlike charges on negative cellulose and positive rosin-aluminum sulfate complex is a major factor in sizing. This theory is only slightly different from the electrostatic theory of Ostwald and Lorenz. 2 tables, 4 diagrams, and 10 references. E.S.

PAPER SPECIALTIES

ANON. Matter of repetition. Chem. Week 73, no. 4: 43-4 (July 25, 1953).

The rapid growth in facsimile processes (blueprinting, including the Mertone process; photocopying systems; the Thermofax process of Minnesota Mining & Manufacturing Co.; xerography; diazotype reproduction, notably the Ozalid and Bruning systems; etc.) and the special papers and chemicals required in each instance are reviewed briefly. Reference is made to the need for translucent paper to render the documents more readily reproducible, involving transparentizers and sealers. 1 illustration. E.S.

ANON. Paper and board used in the electrical-construction industry. Papier, carton et cellulose 2, no. 2: 51-2 (May-June, 1953). [In French]

The applications and requirements of the following groups of paper employed in the electrical industry are described: (*a*) paper and boards as they come off the machine (wrapping and kraft papers, electrical pressboard, and different tissue papers); (*b*) paper and boards subjected to further conversion, such as creping, gumming, and corrugating; (*c*) paper and board subjected to chemical treatment (vulcanized fiber); and (*d*) paper-base products used for electrical insulation (impregnated and laminated papers and boards, mica paper, etc.). E.S.

ANON. Paper snow fence. J. Franklin Inst. 256, no. 1: 102 (July, 1953).

A snow fence made of two-ply paper with an inner layer of fiber and asphalt has been used experimentally in Michigan with generally satisfactory results. The sandwich filler of asphalt promotes resistance to moisture and gives strength and toughness. In tests, paper snow fencing withstood bad sleeting, heavy rain, and high winds. E.S.

ANON. Silicones in the paper industry. Allgem. Papier-Rundschau no. 8: 338-9 (April 20, 1953). [In German]

The use of silicones in the form of oils, grease, resins, and rubber in many industries is reviewed briefly. In the paper industry they find application as antistick and impregnating agents for the manufacture of water-repellent paper, cleansing tissues for eyeglasses, and as antifoaming agents in beaters, etc. E.S.

BALCOM, J. G. Ledger papers. Paper Making and Paper Selling 72, no. 1: 11 (Spring, 1953).

A brief description of the properties and advantages of ledger papers is given; simple tests for the evaluation of their quality are included. R.A.S.

L. N. Decorating paper manufactured on the paper machine. Allgem. Papier-Rundschau no. 9: 376-7 (May 5, 1953). [In German]

The principal processes are described by which decorative effects can be produced on the Fourdrinier machine, i.e., without a separate conversion process. Reference is made to the Italian Diana process, the American Wilox process, and the Indiana process, in which mottling fibers are added either to the beater shortly before dumping or to the Fourdrinier wire by means of special flow boxes for producing two-colored effects. Dry colored pigments or other dyestuff powders or highly viscous substances may also be distributed from flow boxes in a similar manner as mottling fibers. Felt strips attached to the dandy roll, fed with dye solutions, and allowed to trail on the paper web will produce colored strips. Grained paper may be prepared by appropriate stock preparation and the use of coarse wet felts. In conclusion, the manufacture of two-colored papers couched from two webs prepared upon combination paper machines is mentioned. E.S.

MACDONALD, R. G. Paper, 25 million tons of words a year. Print 8, no. 1: 29-34 (1953).

Intended as an introduction to the part paper plays in the graphic arts, a brief history of important events and developments in papermaking is presented, including a description of the basic types of paper and finishes and mention of the many grades of paper and board in existence. 6 illustrations and 10 references. E.S.

MERTLE, J. S. Gelatino-silver emulsions. Parts 7 and 10. Natl. Lithographer 60, no. 4: 40-3; no. 7: 38-40 (April, July, 1953).

In a 10-part article giving an outline of gelatin emulsion history, reference is made to the three main supports on which these emulsions are commercially coated: paper, film, and glass. In part 7, early attempts of making gelatin-coated paper are recorded. In part 10, the modern manufacture of sensitized papers is mentioned briefly. Numerous illustrations and 230 references in the entire article. E.S.

OHL, FRITZ. Water-vaporproof paper products. Allgem. Papier-Rundschau no. 7: 286-8 (April 2, 1953). [In German]

The author discusses the use of microcrystalline waxes alone or in combination with plastics, and laminations of treated glassine and kraft papers for obtaining water-vaporproof packaging materials with greatly improved resistance on creasing. Creping of treated kraft paper (to be used in multi-ply

bags) still presents certain manufacturing problems, and the results are not quite satisfactory. E.S.

STANCZAK, F. J. Effect of possible moisture pickup on cork molding blankets. Progress Report No. 2. Am. Newspaper Publ. Assoc., Tech. Report no. 9: 7 p. (March 24, 1953).

This is the second in a series of reports on stereotype reproduction quality losses. The study reported here was made in an effort to determine whether cork molding blankets picked up moisture from high shrinkage mats and, if this did occur, whether the character of the cork was sufficiently affected to interfere with good reproduction. Sample cork molding blankets, 0.25 inch in thickness, were molded against 25 mats. The weight of the cork was measured after each mat was rolled. In each instance the weight of the cork showed no increase, and the weight of the mat remained essentially unchanged. In most instances after 25 molding operations the weight of the cork was somewhat less than the original weight. Any change in cork molding characteristics is probably caused more by the actual dimensional change of the cork under molding pressures rather than by any moisture change in the cork. 5 tables. E.S.

STANCZAK, F. J. Reproduction quality of stereotype mats. Progress Report No. 1. Am. Newspaper Publ. Assoc., Tech. Report no. 8: 36 p. (Sept. 16, 1952).

The quality of reproduction obtainable from the original form in the final printed result is dependent upon many variables in the process of stereotyping and printing. This report covers two phases of the problem, distortion caused by shrinkage and loss of reproduction quality in high shrinkage mats attributable to loss of depth of mold of halftones. Whether the amount of distortion (5.4%) obtainable with the highest shrinkage mat is detrimental to an advertisement is the problem under consideration. Numercially, a ⅝-inch shrinkage mat shrinks 3.9% widthwise, and 0.9% lengthwise, providing a differential shrinkage (distortion) of 3%. These figures compare with a differential shrinkage of 5.4% (7.7% widthwise minus 2.3% lengthwise) for a 1.25-inch shrinkage mat. Therefore, a newspaper changing from a ⅝-inch shrinkage mat to a 1.25-inch mat would increase its distortion from 3 to 5.4%, a change of 2.4%. As far as mold-depth retention in the mat is concerned, data show that high-shrinkage mats can retain the same depth of mold as low-shrinkage mats. It is, therefore, concluded that loss of reproduction quality, if any, must to a large extent be dependent upon other variables. Other phases of this problem which need investigation are listed. 11 tables and 5 figures. E.S.

TOLVI, ERKKI K. Creped kraft paper. Paper and Timber (Finland) 35, no. 4: 200-2, 204 (April, 1953). [In Finnish; English summary]

The purpose of creping is to produce a tough paper by increasing its flexibility and stretchability, properties which are desirable in certain of its applications. At first, creped papers were principally made from sulfite stock for decorative and household purposes. During recent years, however, the use of creped paper made of kraft has reached a considerable extent in the packaging industry. The purpose of tests carried out at the Walkiakoski kraft paper mill was, in the first place, to investigate the effect of creping on the strength properties. Four papers of different basis weights were creped (40, 65, 90, and 123 grams/sq. m.); the degree of creping was 10 to 90%. The tensile strength in the machine direction of creped paper decreased to

about 50% of the original value and was independent of the degree of creping and the basis weight. The breaking force varied from 40 to 50% and was, on the average, 46.6% of the tensile strength of the raw paper. The effect of creping on the bursting strength was approximately the same as on the tensile strength. The bursting strength of papers of lower basis weight was relatively better than that of thicker papers. The minimum for all papers was obtained when the creping degree was about 30%, although this is principally due to the fact that the bursting strength was determined with the Mullen tester. The strength in the cross-machine direction of raw paper is important for the bursting strength of creped paper because, when the creping degree is over 40%, the line of rupture in the Mullen test appeared in the machine direction. A good tearing strength is a desirable property for wrapping and packaging papers; by means of creping, this strength can be considerably improved. The results are given in the machine direction only, because when the tearing strength in the cross-machine direction is determined with the Marx-Mallet tester, the tear turns gradually to the machine direction. In the creping process, the bonds between the fibers are weakened to about 50% of the original strength. This results from the push of the creping doctor which loosens the fibers in the wet sheet. The shrinkage which occurs during drying is no longer able to draw the fibers sufficiently close together, and at least a part of the fiber bonds remain weak. The effect of fiber direction on the formation and strength of creped paper was next investigated. The creping was conducted in the cross-machine direction and at an angle of 45°. The importance of the cross-machine direction of the raw paper for the creped paper was discovered at the same time. When the creping degree changes from 10 to 90%, the cross-machine direction of the raw paper should change from 74 to 41%. Finally, the force necessary for completely stretching creped paper at various degrees of creping was also determined. The maximum force necessary for complete stretching was approximately of the same magnitude in the different cases and, consequently, independent of the creping degree. 5 tables and 7 diagrams. E.S.

VAN WAGTENDONK, G. M. Infra-red drying of stereotype flong and moulding felt. Intern. Bull. for the Printing and Allied Trades no. 64: 6-8 (April, 1953). [In French and English]

The author describes the advantages of infrared drying of matrix or stereotype paper and molding felts over the usual method of drying with electric elements or gas burners. On account of the penetrating force of the infrared rays, drying starts in the middle of the mat and proceeds gradually without trapping of moisture and the formation of bubbles; a smoother surface of the mat with clear impressions results. The durability of the mats is also improved. 6 figures in the English text. E.S.

PATENTS

ARNOLD, GRAHAM. Victorian vista; examples of ingenuity among paper making patentees. Paper-Maker (London) 125: 38, 40 (Mid-Summer, 1953).

Some of the early 19th-century patents for introducing new prolific and economic sources of cellulose for papermaking are reviewed. E.S.

PHYSICAL TESTING—FASTNESS TO LIGHT

AMERICAN ASSOCIATION OF TEXTILE CHEMISTS AND COLORISTS. *Research Subcommittee on Fastness to Light.* Study of anomalous

fading in the Fade-Ometer. Am. Dyestuff Reptr. 42, no. 12: P379-85 (June 8, 1953).

A progress report of a study to disclose anomalous lamp fadings sponsored by the Association and the Atlas Electric Devices Co., is presented. The study was begun by making sunlight-exposure tests under varying conditions; the results are used as standards with which the effect of experimental changes in the lamp can be compared. The Atlas Co. is building sunlight cabinets to conform with suggestions of the AATCC Committee on Color Fastness to Light and others; a description of the cabinet is included. Tests and experience have demonstrated that there are several conditions in the lamp which influence fading, including air temperature, humidity, electric energy fed to and physical conditions of the arc, spectral quality and intensity of the light, and the distance from the arc and the angle at which the light rays reach the surface of the test samples. Variations in these separate conditions will cause minor variations in one or more of the others. The Atlas Co. constructed for the Philadelphia Quartermaster Research Laboratories an experimental Fade-Ometer (FO 2710, not intended for general use) for studies on the colorfastness and aging of plastic films, and a similar lamp was built for the present studies on textiles. Details of the construction are given. These instruments were designed to develop reliable information on the effect of relatively wide variations in the conditions known to influence fading. 1 table, 7 figures, and 3 references. E.S.

PHYSICAL TESTING—PAPER—MOISTURE

McCONCHIE, V. J. The Fielden Drimeter for continuously indicating moisture content of paper. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 51-73 + 2 plates; discussion: 73-5 (1952).

A Fielden Drimeter (*cf.* B.I.P.C. 19: 716) was fitted to the No. 2 machine at the Fairfield mill of Australian Paper Manufacturers Limited for the continuous indication of the moisture content of paper as it was produced. The instrument, an electronic capacitative one developed for the textile industry, required some modifications before it could be satisfactorily applied to a paper machine. Circuit details and a description of the instrument as used in the experimental work, and also details of a recently developed modified form of Drimeter which has only just arrived in Australia, are given. Difficulties encountered in applying the Drimeter to a paper machine are described. Instability, distortion of the electrodes for various reasons, effect of sheet tension, sheet-weight variation, etc., and the steps taken to eliminate their effects are described. Correlation checks between the instrument reading and oven-drying gravimetric tests were carried out. The method for calibration and correlation performed while the instrument was operating on the machine is given. Further work remains to be done on the effect of furnish variations, but now that mechanical defects appear to have been overcome this should be fairly straightforward. Ideas for a number of improvements on the instrument are advanced, and a suggestion to incorporate a substance-correcting instrument with a Drimeter type of instrument is made. 1 table, 4 figures, and 8 references. E.S.

PHYSICAL TESTING—PAPER—PRINTABILITY

BECKMAN, N. J. and SEARS, G. R. Testing methods for printability of paper. Progress Report Seven by The Institute of Paper Chemistry, *Appleton, Wis.* Am. Newspaper Publ. Assoc., Tech. Report no. 11: 18 p. (May 22, 1953); *cf.* B.I.P.C. 22: 764-5.

Analyzing data obtained in an earlier study, it is shown that the thickness

of the ink film available for transfer and the thickness of the ink film actually transferred are related in such a way that the technician can describe, after making only a few measurements, the character of ink transfer for a range of ink films. Two straight lines (one rising and one falling) are produced by plotting the logarithm of the film thickness of transferred ink against the logarithm of the film thickness of ink originally available for transfer. (The same relationship exists between the weights of available and transferred ink.) These plotted lines rise or fall more or less abruptly according to roll speed, paper, ink, and roll weight. The same variables govern the point at which an upward trend gives way to a downward trend. Additional findings suggest an entirely new nonmechanical means of measuring paper smoothness. Thick ink films are, within limits, more efficiently transferred than thin ink films, i.e., their transfer is characterized by a higher percentage of available ink. It is postulated that the decline in efficiency associated with the transfer of thin ink films is due to the effect of irregularities in the paper surface. Therefore, if two equally thin films are transferred with differing degrees of efficiency, it can be supposed that the more fully transferred film was applied to a smoother surface. Smoothness values based on this hypothesis agree well with values obtained by the Chapman smoothness tester. 1 table and 8 figures. E.S.

PHYSICAL TESTING—PAPER—STIFFNESS

HOBBS, R. B., and WORTHINGTON, V. Measuring the stiffness of paper. Modern Packaging 26, no. 11: 127-9, 190 (July, 1953).

A review of the current test methods and discussion of the Carson-Worthington stiffness tester (*cf.* B.I.P.C. 23: 432) are given. A new stiffness tester, the J & J "Handle-O-Meter" is mentioned as being put into production. In view of these various developments, the authors stress the need for a comparative evaluation of accepted definitions of terms relating to the concepts of stiffness, softness, and rigidity; a consideration of the sensitivity, reproducibility, ease of handling, and ruggedness of the different instruments; and, if possible, a correlation with practical evaluation of samples. 1 table, 3 figures, and 7 references. R.A.S.

PHYSICAL TESTING—PAPER—TENSILE STRENGTH

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY. Zero-span breaking length of pulp. Tappi 36, no. 7: 114-16A (July, 1953); *cf.* B.I.P.C. 14: 180.

The text of TAPPI Suggested Method T 231 sm-53 is presented. The objective of this method is to provide a means for determining: (*a*) an index of the average ultimate strength of the randomly oriented fibers in a pulp-test handsheet, and (*b*) an index of the degree of bonding between fibers in the sheet. For this purpose a specially constructed pair of supplementary jaws is inserted in the jaws of a conventional tensile tester. Details of the apparatus, calibration, test specimen, procedure, and method of reporting are given. 2 figures and 2 references. E.S.

PHYSICAL TESTING—PAPER—TRANSPARENCY

LEIDL, E. Light permeability of paper and its measurement. Allgem. Papier-Rundschau no. 6: 247-8 (March 20, 1953). [In German]

The author discusses briefly the use requirements of transparency or opacity of different paper grades, and the way in which these properties can be influenced by correct stock preparation. The use of a photocell and Multi-

flex galvanometer for measuring transparency or opacity and the necessary calculations are outlined. E.S.

PHYSICAL TESTING—SULFITE WASTE LIQUOR

TREIBER, E., KLEINERT, TH., and WINCOR, W. Determination of sulfite waste liquors in water by ultraviolet absorption measurements. Holzforschung 6, no. 4: 101-2 (1952). [In German; English summary]

Ultraviolet absorption measurements of beech (I) and spruce spent sulfite liquors (II) are described; they serve to supplement earlier colorimetric and bromometric methods (*cf.* B.I.P.C. 23: 546-7). Ultraviolet measurements permit the determination of (I) and (II) in dilutions of one part in 10^5. The measurements, described in some detail, involve the use of a model DU Beckman quartz spectrophotometer; readings were made at 278 mμ at which (I) and (II) gave nearly identical values. 1 table, 1 figure, and 6 references. L.E.W.

PIGMENTS

BENNETT, G. R. Titanium dioxide and its application to the paper industry. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 214-28; discussion: 228-30 (1952).

This paper is essentially a review of the available literature on titanium dioxide and its pertinence to the paper industry. The manufacture of both pure titanium dioxide and the extended pigments are described with brief reference to the difficulties involved. A fundamental approach to the relationship existing between the structure of the crystal lattice and the physical properties of a substance is included, along with some discussion on the effect of subdivision and surface phenomena of microparticles on the properties of aqueous dispersions. Chemical factors influencing the retention of titanium pigments, supported by the results of a recent investigation, are outlined, and follow a brief note on the variables introduced by machine design. The effect of the pigment on brightness and opacity and other properties influenced by its use is discussed and, although little practical data are given in the paper, adequate references to the literature are included. Some features of the cost *vs.* improvement relationship for the use of titanium dioxide in the paper industry are cited. 5 tables, 2 figures, and 14 references. E.S.

PITCH TROUBLES

BACK, ERNST. Method for mill evaluation of paper machine pitch troubles. Svensk Papperstidn. 56, no. 11: 420-1 (June 15, 1953). [In English; German and Swedish summaries]

A method for evaluating the extent of pitch deposition on the Fourdrinier wire is described; it involves the count of the thin spots (exceeding 3 mm. in diameter) formed in the paper by the pitch-filled apertures of the wire. The method is applicable only to papers of low basis weight. In spite of its simplicity it gives reproducible values of occurring pitch troubles. Its application to the evaluation of several pitch-control agents is explained by examples. 4 figures. E.S.

PLASTIC FILMS—TESTING

KISH, ALADAR F. Films for pre-packaged poultry. Modern Packaging 26, no. 11: 130-4, 193 (July, 1953).

Preliminary studies on prepackaged poultry wrapped in flexible films are reported. The conclusions reached as a result of these investigations include: Prepackaged, fresh-killed, eviscerated poultry should be kept no longer than 48 hours at 34-38°F. in a self-service, open-top refrigerator. The over-all performance of the four films tested (300 LSAT cellophane, 100 saran 517, 100 polyethylene film, and 120 Pliofilm HM) was essentially the same through the 48 hours of the package period; the test results indicate also that it is better to perforate the packages after wrapping. Severe dehydration occurring within 24 hours with the unwrapped poultry indicates the need for a protective wrapper. There were no slime or off-color developments with any of the films in 48 hours; carcass color changes were slightly greater in LSAT film after 72 hours, but the presence of off-odors and slime development was not as great as with other test films. LSAT cellophane was superior to all films tested in minimizing package condensation, in package appearance and brilliance, and in ease of handling during the packaging operation. 5 tables and 2 illustrations. R.A.S.

PLASTIC FILMS (NONCELLULOSIC)

FARRELLY, WALTER F. Polyethylene bag making problems. Am. Paper Converter 27, no. 7: 18-20, 58, 60 (July, 1953).

Conversion problems caused by certain properties of polyethylene film and methods of solving them are discussed. The resistance of the film to adhesion, although an advantage in packaging sticky substances, eliminates methods of sealing other than heat sealing. However, when the temperature is raised to 250°F., the film will stick to almost anything, including bare metal. Teflon (polytetrafluoroethylene) sprayed on the metal surfaces of the heat-sealing element will prevent the film from adhering. Static charges can be effectively eliminated by an electrical discharge method. Tensilizing, the process of orienting all long-chain molecules in the same direction to increase the strength of the sheet, is described, as well as methods for preparing neat seals on all seams. R.A.S.

OSWIN, C. R. The application of protective wrappings. Part 8. Qualitative selection. Brit. Packer 15, no. 5: 336-9 (May, 1953); *cf.* B.I.P.C. 23: 745.

A most suitable wrapping must be selected not only for the protection it offers to water-sensitive goods, but also to goods sensitive to other deteriorating agents, such as certain chemicals (oxygen, carbon dioxide, and ethylene), or light rays. With reference to the work of Platenius (*cf.* B.I.P.C. 17: 338), suitable ventilation for certain types of packages is discussed; in addition, exclusion or inclusion of odors, suitable flexible wrappings for liquids, and wrappings selected for thermal endurance are considered. 2 tables and 28 references. E.S.

THOR, C. J. B. Development and applications of polyethylene film. Am. Paper Converter 27, no. 6: 11-14 (June, 1953).

The physical and chemical characteristics of polyethylene film, a thermoplastic resin with a low moisture-vapor transmission rate, and good flexibility, tensile strength, tear resistance, and impact strength, are reviewed. The film is the lightest commercially available film; it contains no plasticizer and therefore is not subject to problems related to plasticizer migration. Printing with flexographic, letterpress, and rotogravure inks; heat sealing and the machinery employed; and uses of the film in food packaging and preservation, liners for drums and containers for chemicals, and packaging of dry goods and hardware are described. A table listing the physico-

chemical properties of the film is included. 1 table and 4 illustrations.
R.A.S.

PRINTING AND PRINTER'S INK

AMERICAN NEWSPAPER PUBLISHERS ASSOCIATION. *Research Department.* Ink and its problems for the pressman. Am. Newspaper Publ. Assoc., Research Bull. no. 61: 41-50 (Oct. 21, 1952).

The composition and preparation of news ink is described. The leading problems of news ink (offset, flying, static electricity, strike-through, show-through, caking, grit, foaming, aging, and dry ink boxes) are defined. Causes and suggested remedies are presented in each case. Since quick-set inks (heat-, steam-, and cold-set) have done much to relieve ink problems in the periodical field, their possible (or impossible) application to the newspaper business is discussed. A partial bibliography with 27 references is appended.
E.S.

BUREAU, WILLIAM H. The relation of paper and moisture. Parts I and II. Printing Equip. Engr. 83, no. 8: 19-20; no. 10: 27-8 (May, July, 1953).

The author describes the relationship between moisture changes and paper behavior in sheet and roll stock. Seasoning of paper during the cold weather must also take temperature changes into account. The effect of moisture on expansion in the grain and cross-machine direction of the sheet, static electricity, curl, and such physical properties as pliability, folding endurance, and tearing strength is discussed. When ordering paper for conditioned plants, it is best to specify the R.H. at which the paper will be printed and let the question of proper moisture equilibrium be decided by the papermaker. Papers differ in their equilibrium moisture content for a given R.H.; coated paper, for instance, has a lower figure than uncoated paper. 1 table and 3 figures.
E.S.

CLAPPER, F. R., and YULE, J. A. C. The effect of multiple internal reflections on the densities of half-tone prints on paper. J. Opt. Soc. Amer. 43, no. 7: 600-3 (July, 1953); *cf.* B.I.P.C. 22: 604.

The equation relating dot area to halftone density, when sideways scattering of light takes place in the paper, has been modified to take into account multiple internal reflections. Curves showing the relationship between dot area and density for various ink densities and amounts of first-surface reflectance are given. Callahan's conclusion that these effects are negligible is not in accordance with the authors' experience, and the new equations indicate the possibility of densities much higher than the limiting values derived from Callahan's equations and from the authors' earlier equation which neglected multiple internal reflectance. 2 diagrams and 7 references. E.S.

DAISH, A. N. Paper and print production. Paper Making and Paper Selling 72, no. 1: 7, 9 (Spring, 1953).

The author presents the printer's approach to the proportionate cost of the paper necessary for a job and the cost of his own work involved in producing the completed piece of printed matter. R.A.S.

MAKARIUS, THEODORE F. Running coated stock. Modern Lithography 21, no. 7: 46, 103 (July, 1953).

The problems encountered when running coated papers through an offset

press are briefly described, and remedies are suggested. The elimination of static conditions is of prime importance. E.S.

MERTLE, J. S. Rotogravure review. Graphic Arts Monthly 25, no. 1: 66, 68, 70, 72, 74, 76 (January, 1953).

The history of rotogravure printing from the original process of photoprinting halftone positives on cylinders sensitized with bichromated fish glue to modifications of the Klic principle of exposing continuous tone positives on carbon tissue in conjunction with a gravure-screen formation is surveyed. Later improvements, such as the use of intaglio halftone methods in place of continuous tone positives, the coating of cylinders with copper, the substitution of other gravure tissue for carbon tissues, the etching on a rotogravure machine, and the testing of ink and paper are considered. R.A.S.

PRINTING AND PRINTER'S INK—ANILINE PROCESS

RICE, WILLIAM J. Basic functions of flexographic printing. Graphic Arts Monthly 25, no. 4: 18, 20, 22, 24, 26 (April, 1953); *cf.* B.I.P.C. 23: 435.

A discussion of flexographic printing (the name adopted at the 1952 meeting of the Packaging Institute to replace aniline, since dyes other than aniline have been found suitable), and inks, presses, and plates used in the process are presented. 6 figures. R.A.S.

PULP AND PAPER—IMPURITIES

ALHOJÄRVI, J. The defibration and cleanliness of sulfite pulp. Svensk Papperstidn. 56, no. 12: 451-5 (June 30, 1953). [In Swedish; English and German summaries]

An investigation on the screening of chemical pulp is at present under way at the Finnish Central Laboratory. The first step comprised a comprehensive literature survey and a questionnaire sent to the mills. Based upon a microscopic study of the impurities present in sulfite pulp received from eight different mills, the impurities were classified into fibrous screenings (49%), bark impurities (44%), resin impurities (5%), and all others (2%). Hence, 98% of all impurities are derived from the wood. The influence of the different stages of stock treatment prior to screening is discussed, with emphasis on defibration; the effect of pumping and blowing of the digesters is also taken into account. The results are presented in tabular and graphic form. The present investigation will be followed by a study of the different screen types. 2 tables and 2 figures. E.S.

KERSLAKE, R. Stock cleaning for board mills. Australian Pulp & Paper Ind., Tech. Assoc. Proc. 6: 30-8; discussion: 39-40 (1952).

The effective cleaning of board mill stock is beneficial in reducing wear in mill tackle and in improving sheet quality and machine operation. A review of current practice in stock cleaning shows the trend toward the vortex type of pulping unit, centrifugal cleaning devices, and improved types of screen. Rapid changes are taking place in these fields. 1 figure and 3 references. E.S.

PULP WASHING

HANNUNKARI, L. Brown stock washing. Svensk Papperstidn. 56, no. 12: 435-42 (June 30, 1953); Paper and Timber (Fin-

land) 35, no. 6: 251-8 (June, 1953). [In Swedish and Finnish; English summaries]

Three different methods of brown-stock washing are discussed. The general practice in the United States and Canada is the use of vacuum filters, either one-stage (Impco) or multiple-stage (Swenson-Nyman) filters. The latest development is the installation of Lindblad filters which have given promising results; power consumption decreases, and foaming troubles are reduced. In some mills in the United States screw presses are used for brown-stock washing; trials with hot-refined stock have not been very encouraging. In Finland (and in Europe in general), diffusers are employed for the washing of kraft pulp. A new method of diffuser washing developed at Oulu Oy's kraft mill in Oulu is described. Conical intermediate bottoms are used to prevent the compacting of the stock on the screen plates during the washing procedure. The best results have been obtained when the flow of the wash liquor is kept constant. However, there are certain limits to the shortening of the washing period by the use of higher flow rates. When the flow rates exceed a certain value, the flow of the wash water through the pulp tends to become less uniform. Hence, a suitable flow rate must be established for each diffuser, and the flow kept constant by means of flowmeters and regulating valves. This new washing method in diffusers of a diameter of 4.9 meters and a height of 8.9 meters has resulted in a 55-60% increase in the production capacity of the mill. 9 diagrams. E.S.

RADIOACTIVITY

ANON. The use of radioisotopes in pulp and paper mills. Indian Pulp and Paper 7, no. 10: 473-7 (April, 1953); *cf.* B.I.P.C. 23: 666.

This gives the same information as the previous article, plus fundamentals not listed in the first reference. E.S.

RESEARCH

WELLWOOD, R. W., and WILSON, J. W. Current research in wood fibres at the University of British Columbia. Pulp Paper Mag. Can. 54, no. 7: 121-4 (June, 1953).

The authors outline the general problems associated with university research, including the methods of carrying it out, research assistants or graduate students doing the work, and sponsors who provide the necessary funds. Current projects are reviewed briefly under the headings: contributions to the development of hardboard technology, contributions to the development of fiber technology, and applied fiber research. E.S.

ROOFING FELTS

MOSES, C. S., and RUSSELL, WILLIAM A. Durability of moisture-resistant membrane materials in contact with the ground. HHFA Housing Research: 23-8 (October, 1952).

This article summarizes research sponsored by the Housing and Home Finance Agency regarding the durability of roofing felt and roll roofing when used for waterproofing membranes in contact with the ground where they are subject to rot fungi commonly associated with damp soil. Conclusions reached are that unprotected 15-pound asphalt-saturated roofing felt in contact with the ground, either as soil cover in a crawl-space house or as a membrane under a slab-on-ground floor, would be destroyed by fungi in a

few years. Roll roofing, on the contrary, which is heavily impregnated and coated with asphalt, would be expected to provide an effective and durable membrane for many years at little or no increase in cost. 1 table and 2 illustrations. E.S.

TURNER, JOHN S. Building Products Limited expands despite fires and floods. Pulp Paper Mag. Can. 54, no. 7: 94-101 (June, 1953).

The history of Building Products Limited from the founding in 1795 by Bird & Son, the company's predecessors, of the paper mill near Needham, Mass. to the present six Canadian manufacturing plants at Montreal, Hamilton, Pont Rouge, Winnipeg, Edmonton (roofing and siding plants), and Havelock (granule crushing plant), is traced. 12 illustrations of the plants and machinery. R.A.S.

RUBBER

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Rubber hardness conversion. Pulp Paper Mag. Can. 54, no. 7: 140 (June, 1953).

The hardness conversion chart for rubber-covered rolls and other rubber products, data sheet G-9, issued June, 1953, is reproduced. 1 chart. E.S.

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Rubber roll covers. Pulp Paper Mag. Can. 54, no. 7: 141 (June, 1953).

A table giving the generally used Plastometer readings for rubber covers in Canadian pulp and paper mills using the Pusey & Jones Plastometer with ⅛-inch ball is reproduced from data sheet G-11, issued August, 1953. 1 table. E.S.

SEMI-CHEMICAL PULPING PROCESS

LIMERICK, J. McK. The continuous manufacture of semichemical pulp for corrugating board. Tappi 36, no. 7: 294-6; appendix: 296-7 (July, 1953); *cf.* B.I.P.C. 21: 579.

As a means toward the conservation of natural resources, the Bathurst Power and Paper Co. has for some years been increasing its yield from the softwood species. This has been followed by the production of corrugating board from all available species of hardwoods by a continuous process. A description of the mill is given; the continuous process is also outlined, including chipping, chip and chemical feeding, cooking, refining, washing, and board making. The pulp quality at various stages of the process is discussed. Changes made in the operation of the semichemical pulp mill since 1951 are mentioned in the appendix. 1 table, 2 figures, 1 flowsheet, and 2 references. E.S.

RUNKEL, R. O. H., SCHAMBACH, H., and WITT, H. Influence of temperature on the production of semichemical pulps from hardwoods by alkaline treatment. Holzforschung 7, no. 1: 9-12 (1953). [In German; English summary]

Beechwood (*Fagus silvatica*) clubs were treated under the following four conditions with 2.4% caustic soda (using a liquor: wood ratio of 10:1): (*a*)

48 hours at 20°C., pulp (I); (*b*) 14 hours at 70°, pulp (II); (*c*) six hours at 100°, pulp (III); and (*d*) three hours at 150°, pulp (IV). The strength properties and quality of the four resulting pulps were determined; no yield figures are given. (I), (II), (III), and (IV) retained about the same percentage of lignin (20.1 to 20.7%), but the pentosans decreased with increasing temperature from 22.8 for (I) to 18% for (IV). (I) was the most rapidly hydrated and showed the highest brightness. (III) showed the highest resistance to tear; its quality increased markedly with extensive beating. The only advantage manifested by (IV) was the relatively rapid increase in folding endurance with beating time. All four pulps showed very similar bursting strengths. Both (I) and (II) showed very low tear and folding endurance even on long beating. On the basis of their experiments the authors suggest that hardwood semichemical soda pulps, prepared at relatively low temperatures merit further attention. 1 table, 6 figures, and 3 references.
L.E.W.

SHIPPING CONTAINERS

HERZOG, HAROLD A. Giant package pays off. Food Eng. 25, no. 7: 57-60 (July, 1953); *cf.* B.I.P.C. 23: 729.

The advantages of the Bulk-Pak-Bin method of packing flour, the use of the semimechanical packer for filling the bins, and their handling and transportation (including the return of the collapsed bins) are described. 16 illustrations.
E.S.

SHIPPING CONTAINERS—FIBER DRUMS

ANON. New fiber drum. J. Franklin Inst. 256, no. 1: 104 (July, 1953).

A new fiber drum for moistureproof shipments, tested by the Department of Agriculture, has been adopted by the Navy for domestic shipment of desiccants by Navy contractors. The drum contains a special aluminum-foil barrier buried in the bottom and sidewall. The top is of metal. Tests proved no significant differences in steel and fiber drums exposed to high humidity conditions. The fiber drum performed satisfactorily in rough handling tests.
E.S.

MATHER, GLENN. Packaging materials and methods. I. Fiber drums. Activities Rept. Research and Develop. Associates, Food and Container Inst. 4, no. 4: 307-10 (January, 1953).

An over-all evaluation of the fiber drum is presented, including applications to bulk shipments, with particular reference to military interest, adaptations to special products, and basic specifications, such as constructional materials, sizes, closures, shipping regulations, and necessary precautions.
E.S.

SHIPPING CONTAINERS—PALLETIZING

ADAMS, D. S. Receiving bagged materials into paper mills in unit loads. Pulp Paper Mag. Can. 54, no. 7: 136-7 (June, 1953).

Experiments with prepalletized shipments of starch at the Oxford Paper Co., Rumford, Me., and the advantages and disadvantages of the procedure are discussed. Expendable paper pallets were used at first and later replaced by 105-point single sheets of chestnut board. This method proved so satisfactory that it is now applied to the handling of calcium carbonate and some other commodities. 2 illustrations.
E.S.

ANON. Pallets facilitate setup box operations. Am. Boxmaker 42, no. 7: 12-13 (July, 1953).

Small pallets for handling and transporting setup boxes facilitate operations in the Friend Box Co. in Danvers, Mass. The pallets are thin pieces of wood comparable to veneer, approximately 18 inches wide by 24 or 26 inches long. Wrapping paper sheets combined with lightweight cardboard form a speedy package for two pallets of boxes; this is used by the company in the shipping room and eliminates the need for more expensive shipping containers. 5 illustrations. R.A.S.

SHIPPING CONTAINERS—TESTING

PARIS, PAUL. Load limits of setup boxes made from machine-made containerboard prepared from steamed groundwood. Allgem. Papier-Rundschau no. 6: 254-5 (March 20, 1953). [In German]

The results of a prewar study of the load limit of setup shipping containers with lids of different depths and bases prepared from either one or two blanks are presented. The test boxes were manufactured from the identical board upon the same machines and were subjected empty to compression in a hydraulic press. Maximum resistance was offered by telescope boxes whose lids and bases had been prepared from a single blank each; when prepared from composite blanks, the values were about 25% lower. Setup boxes whose lid and base met in the center carried approximately 55% less of the load than telescope boxes and about 5% more than boxes with narrow lids. 1 table and 3 figures. E.S.

SOLVENT CLEANING

ATKIN, W. C. Chemical cleaning in pulp and paper mills. Paper Mill News 76, no. 25: 133-4 (June 20, 1953).

The possibilities for chemical cleaning in pulp and paper mills, including power house and groundwood, sulfite, and sulfate mills, are discussed; the chief advantage of the process is its time-saving factor. Several case histories of applications are described. 3 figures. E.S.

SPONGES, ARTIFICIAL

ANON. Natural phenomenon replaced by product of chemical process. Can. Chem. Processing 37, no. 5: 46, 48 (May, 1953); *cf.* B.I.P.C. 23: 669.

The manufacture of cellulose sponges at Shawinigan Falls, Que. by Canadian Industries Limited is described. 4 illustrations. E.S.

STARCH

BOTTLE, R. T., GILBERT, G. A., GREENWOOD, C. T., and SAAD, K. N. Degradation of potato amylose in neutral and alkaline solution. Chemistry & Industry no. 22: 541-2 (May 30, 1953).

The degradation of amylose at 100°C. in water, 0.5 *N* sodium hydroxide, and phosphate and acetate buffer solutions was studied in the presence of various gases by measurement of intrinsic viscosity. It is shown that amylose in aqueous solution degrades slowly at 100° in the presence of air or oxygen, whereas in hydrogen practically no degradation occurs even after heating for 40 hours. Degradation in alkaline solution at 100° is rapid unless oxygen is excluded. Increase in the buffer concentration at a neutral

pH also increases the rate of degradation. The amylose, amylopectin, and glycogen prepared by methods published previously are probably degraded products. Such degradation has most likely affected methods of end-group assay and structure determination by means of enzymes. 2 tables and 8 references. J.W.S.

FISCHER, ED. H., and SETTELE, W. Research on starch. 54. Chromatographic fractionation of starch. Helv. Chim. Acta 36, no. 4: 811-19 (June 15, 1953). [In French; English summary] *cf.* B.I.P.C. 23: 827.

Synthetically prepared mixtures of tapioca amylose and amylopectin, as well as natural starches of maize, potato, and tapioca, were studied by means of chromatographic fractionation on alumina columns in an aqueous medium. The affinity of neutral alumina for the constituents of starch is stronger than that of acid alumina; it remains relatively weak in either case. Amylose is best eluated by an acid buffer and gives a single sharp fraction. With amylopectin, the best results are obtained with a neutral buffer which affords several fractions. The eluated fractions were analyzed by colorimetric determination of the polysaccharide content and of the proportion of amylose and amylopectin. Color development by iodine gives approximate indications which are only of value as control. Favorable conditions for a selective separation of the two constituents of starch were determined. The amylopectins were separated into several subfractions. The amyloses, on the other hand, yielded only one fraction, except in the case of tapioca amylose, where two subfractions were obtained. 2 tables, 4 figures, and 22 references. E.S.

ONO, SÔZABURO, TSUCHIHASHI, SHINPEI, and KUGE, TAKASHI. On the starch-iodine complex. J. Am. Chem. Soc. 75, no. 14: 3601-2 (July 20, 1953).

A quantitative study of the relationship between iodide concentration (I) and the wavelength of maximum absorption (λ max.) of the starch-iodine complex (II) shows that λ max. shifts toward the shorter wavelengths, and the resonating polyiodine chains become shorter as (I) is increased. Ethanol exhibited a similar effect. For potato-starch amylose (D.P. 480) and (I) equal to zero, the ratio of glucose to molecule of iodine (2 atoms) was 6:1. H. Kuhn's mathematical treatment of polyenes (*cf.* J. Chem. Phys. 17: 1198-212 [1949]) is applied satisfactorily to the experimental results. 1 table and 11 references. E.E.D.

STATISTICAL METHODS

PURCELL, W. R. Facts versus opinions. Tappi 36, no. 7: 132A (July, 1953).

By the application of statistics, quality control (although as old as manufacturing itself) is recently emerging as a separate profession. The author briefly reviews the advantages of statistical quality control in which opinions are replaced by facts. E.S.

SOOY, BRAINARD E. Some applications of statistical quality control in the paper boxboard industry. Paper Trade J. 136, no. 26: 20-2 (June 26, 1953); *cf.* B.I.P.C. 23: 203-4.

Essentially the same information as in the previous reference was presented at a seminar of statistical control for the graphic arts industry in New York in April, 1953. 2 figures. E.S.

STEAM POWER

GILG, F. X. Packaged steam generators in the paper industry. Tappi 36, no. 7: 324-30 (July, 1953).

A "packaged steam generator" is a standardized, shop-assembled boiler, equipped and shipped complete with fuel-burning equipment, mechanical draft equipment, automatic combustion controls with fuel and low-water cutouts, and other accessories. There are fire-tube types and water-tube types. The author describes a water-tube type and shows that it really is an extension of the integral-furnace series, in which boiler and water-cooled furnace are designed as an integral unit, with over-all dimensions of length, width, and height limited to meet common-carrier (rail and truck) specifications on weight and clearances. For sizes to generate up to 28,000 lb. of steam/hour and moderate pressures to 250 p.s.i., packaged steam generators are being used more and more in the paper industry because low fuel, maintenance, and operating costs, compactness, portability, simplicity, reliability, and safety in operation are necessities in this progressive industry. Typical examples with pictures of modern installations in paper mills are described with their salient features, operating data, and fuel costs. Automatic combustion-control systems are discussed to show the emphasis given to safety and simplicity in operation. 1 table and 14 illustrations. E.S.

WADE, CHAS. F. Preheated combustion air. Paper-Maker (London) 125, no. 5: 395-6 (May, 1953).

The author discusses the many commendable features of air preheaters for fuel combustion, particularly in connection with industries using large and fluctuating quantities of process steam, such as the paper industry. E.S.

STRAW

ROUDIER, A. Uronic acid groups present in pulp made from wheat straw and the ion-exchange properties of such pulp. Assoc. tech. ind. papetière, Bull. no. 4: 118-20 (1953). [In French]

Paper chromatograms of the components of partially hydrolyzed wheat-straw pulp (I) showed the presence of arabinose, xylose, xylobiose, xylotriose, and xylotetraose, and a nonmobile portion which contained uronic acid groups. The original (I), washed successively with hydrochloric acid, water, ethanol, and benzene, when placed in a column and treated with calcium acetate, served to fix calcium and to free acetic acid almost quantitatively. Thus 47.6 grams of (I) retained about 57.7 mg. of calcium (which thus shows a very weak retention as compared with Amberlite IRC-50). The possible disadvantageous consequences of these ion-exchange properties of (I) are discussed. 1 table, 3 figures, and 13 references. L.E.W.

STRAW—WASTE LIQUOR

JUNG, H. Rapid digestion for the treatment of waste waters highly polluted with organic matter. Vom Wasser 17: 38-48 (1949); Water Pollution Abstr. 25, no. 1: 19 (January, 1952). [In German; abstract in English]

Waste waters from the manufacture of strawboard are highly polluted, with a permanganate demand of about 5000 mg./liter and a five-day B.O.D. of about 2500 mg./liter. Laboratory experiments are described which showed that by digestion of a mixture of the waste waters with digested sludge from domestic sewage, accompanied by intermittent stirring, an anaerobic flocculent

sludge was produced which settled easily and had strong adsorptive properties. The permanganate demand was reduced by 50 to 60%, and the B.O.D. by about 40%. An experimental semiscale plant was then constructed, comprising a digestion tank with a slowly moving paddle stirrer, a sedimentation tank, and a sludge-digestion tank with heating equipment. Sludge was withdrawn at intervals from the waste-water digestion tank to the sludge-digestion tank and replaced with digested sludge. With a retention period of 15 hours at a temperature of 12 to 14°C., the permanganate demand was reduced on the average by 50%, and the B.O.D. by 40%. At higher temperatures better results could be achieved. The process is recommended for preliminary or partial treatment of strawboard-waste water; complete treatment by subsequent chemical precipitation and biological treatment in percolating filters or by the activated-sludge process has been found to give very satisfactory results. The process would also be useful for treatment of other similar waste waters, such as those from flax retting, distilleries, and yeast and sugar factories. 1 table and 3 figures. E.S.

STREAM POLLUTION

DOUDOROFF, PETER, and KATZ, MAX. Critical review of literature on the toxicity of industrial wastes and their components to fish. II. The metals, as salts. Sewage Ind. Wastes 25, no. 7: 802-39 (July, 1953); *cf.* B.I.P.C. 21: 271.

The review summarizes the published literature on this subject since 1910; a few earlier publications of special interest are cited. The toxicity of the salts of aluminum, arsenic, barium, cadmium, calcium, chromium, cobalt, copper, iron, lead, lithium, magnesium, manganese, mercury, nickel, potassium, silver, sodium, strontium, tin, and zinc, is considered individually and in certain combinations. 1 table and 155 references. R.A.S.

PESCH, A. W. Kraft mill effluents. Tappi 36, no. 7: 124-6A (July, 1953).

With reference to the research project of the National Council for Stream Improvement at Louisiana State University (*cf.* B.I.P.C. 23: 670) for the chemical and biological treatment of kraft mill wastes, the author discusses the results obtained to date and current work. In addition, he reviews general developments on kraft-mill waste reduction and pollution abatement, including black-liquor recovery and reduction of washer and evaporator room losses and paper-mill fiber losses. E.S.

VAN HORN, WILLIS M. Using biology as a tool in stream pollution work. Wastes Eng. 23, no. 2: 71-3 (February, 1952).

The author discusses biological methods in the form of field and laboratory studies as applied to the measurement of stream pollution. Examples of stream, toxicity, and pathological studies are given. 3 illustrations. E.S.

VERMELIN, H. The development of regulations in the disposal of industrial effluents. Papier, carton et cellulose 2, no. 2: 73-4, 77 (May-June, 1953). [In French]

The present status of stream-pollution control in France and impending stricter legislation are discussed. E.S.

SULFITE WASTE LIQUOR

LEWIS, HARRY F. Activities of the Sulphite Pulp Manufacturers'

Research League, Inc. Proc. Fourth Ann. Ind. Waste Conf., State Coll. of Washington: 35-42 (1952).

Following a brief history of the League and its development, the author reviews its accomplishments from 1939-1952, including whole-liquor studies (evaporation and burning, briquetting, road-binder studies, and miscellaneous) and studies on fractions (sugar, lignin, and recovery of pulping chemicals). E.S.

SCHMIDT, ERWIN. Can the oxygen demand in sulphite waste liquor effluent be measured by permanganate consumption? Tappi 36, no. 7: 291-4 (July, 1953); *cf.* B.I.P.C. 23: 52.

This article is a complete English translation of the German original. 5 tables and 1 figure. E.S.

TURVOLGYI, B. L., ANYAS-WEISZ, L., and GRAYDON, W. F. Ligninsulphonic acids as ion-exchange regenerants. Can. J. Technol. 31, nos. 7 and 8: 168-71 (July-August, 1953).

Mixed-bed, ion-exchange columns can be regenerated without separation by prior regeneration of the anion-exchange resin with sodium hydroxide solutions and subsequent regeneration of the cation-exchange resin with lignosulfonic acid solutions. The large lignosulfonate anions exchange very slowly. Data are reported for regeneration level and leakage of lignosulfonic acids in the regeneration of a cation-exchange resin and for exchange of lignosulfonic acids on an anion-exchange resin. 1 table, 3 figures, and 2 references. E.S.

SULFUR

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Friction loss of molten sulphur in pipe. Pulp Paper Mag. Can. 54, no. 7: 143 (June, 1953).

A chart giving the pressure drop in pumping molten sulfur through standard iron pipe is reproduced from data sheet C-10, issued June, 1953. The original reference by C. E. Butterworth appeared in Chem. & Met. Eng. 53, no. 6: 116 (June, 1946). 1 chart. E.S.

SYNTHETIC FIBERS

TEXTILE OR'GANON. World man-made fiber survey. Textile Or'ganon 24, no. 6: 81-96 (June, 1953).

Almost the entire issue is devoted to the annual world survey of synthetic fibers for 1952 and earlier years. The 1952 output totaled 3905 million pounds, 9% below the 1951 record of 4288 million pounds. Rayon was off 9% and acetate 20%, whereas the noncellulosic fibers increased 24%. A world directory of producers of synthetic fibers (segregated into the different rayon types, acetate, and noncellulosic fibers) is included. 2 diagrams and numerous tables. E.S.

TALL OIL

POLLAK, ARTHUR. Something about tall oil. Tall Oil in Ind. Bull. no. 1: 4 p. (April, 1948; reprinted February, 1953).

This is an exact reprint of the first bulletin of this series, with the exception of the production diagram which has been extended to 1950. A definition of tall oil is given, and nomenclature, preparation, physical and

chemical properties, refining, testing methods, uses, and production of tall oil are reviewed. 2 tables and 1 diagram. E.S.

STOLTZ, E. M., BALLUN, A. T., FERLIN, H. J., and KARABINOS, J. V. Tall oil studies. I. Effect of chain length and composition on detergency of built polyethenoxy tallates. J. Am. Oil Chemists' Soc. 30, no. 7: 271-3 (July, 1953).

Different grades and compositions of tall oil, varying from pure abietic to pure oleic acid, were condensed with ethylene oxide gas in an inert atmosphere at 170-190°C., using potassium carbonate as catalyst. Soil removal and whiteness retention in hard and soft water of the resulting polyethenoxy tallates (I) were determined on swatches. The results indicate that the (I) prepared with a large proportion of rosin acid have a slightly improved over-all detergency. In the second test two tall oil samples, one rich in rosin acid and the other rich in fatty acid, were condensed with ethylene oxide progressively, using potassium hydroxide as catalyst. Detergency tests indicated that the polyethenoxy chain length has a pronounced effect on the results. The minimum chain length for optimum soil removal is approximately 13-14 ethenoxy units; for optimum whiteness retention, 14-15 units are desirable. As a check on the number of ethenoxy groups in the various esters, a saponification method was applied to these substances, the details of which are given. 2 tables, 2 figures, and 6 references. E.S.

TALL OIL ASSOCIATION. Tall oil in asphalt products. Tall Oil in Ind. Bull. no. 12: 4 p. (June, 1953); Tappi 36, no. 8: 108-11A (August, 1953); *cf.* B.I.P.C. 23: 283.

The possibilities of tall oil for improving the usefulness of asphalt and related materials (bitumen, gilsonite, etc.) for road paving, cut-back asphalt, road emulsions, soil treatments, drilling fluids, paperboard sizes, asphalt tile, adhesives, and printing inks are reviewed. 52 references. E.S.

TEXTILE INDUSTRY AND FABRICS—TESTING

KRAMMES, RAY, and MARESH, CHARLES. Identification of textile finishes. Am. Dyestuff Reptr. 42, no. 11: 317-27 (May 25, 1953); *cf.* B.I.P.C. 17: 320.

A removal-by-solvent procedure with five different solvents (carbon tetrachloride, ethyl alcohol, water, dioxane, and hydrochloric acid) similar to that introduced by Skinkle is described; some of the specific tests which follow the removal of the resins have been modified and improved. Staining and spotting reactions, as well as other methods of physical analysis, have been introduced wherever applicable. 6 tables, 20 figures, and 13 references. E.S.

VACUUM COATING

BELSER, RICHARD B. Thin metal films—new methods for their production. Georgia Inst. Technol. State Eng. Expt. Sta. Research Engr. 1952-1953, no. 1: 7-8, 21-4 (May, 1952).

The author describes the deposition of thin metal films by vacuum-coating techniques, including evaporation and sputtering. The former may be used for decorative purposes on glass, plastics, cloth, paper, and many other substances; evaporated films have also gained considerable prominence in the electronic industries through use in capacitors, circuit elements, and crystal plating. Sputtering has its greatest application in the coating of mirrors and quartz crystals in the electronics industry. 5 figures and 3 references. E.S.

VISCOSITY

CANADIAN PULP AND PAPER ASSOCIATION. *Technical Section. Engineering Data Sheet Committee.* Viscosity of water. Pulp Paper Mag. Can. 54, no. 7: 142 (June, 1953).

A graph showing the variation of the absolute viscosity in centipoises and f.p.s. units with temperature in Fahrenheit and Centigrade degrees is reproduced from data sheet Z-14. Formulas are given to change the absolute viscosity to kinematic viscosity; conversion factors are included for absolute viscosity in poises to f.p.s. units and *vice versa,* and for kinematic viscosity in stokes to f.p.s. units and *vice versa.* Figures are derived from Bureau of Standards data of 1918. 1 chart. R.A.S.

WATER-MARKS

ANON. Watermarks as protection against forgery. Allgem. Papier-Rundschau no. 9: 383-4 (May 5, 1953). [In German]

Useful directions are given for supplementing print and watermarks in safety paper in such a manner that the former does not obliterate the latter. Frequent changing of both impressed and genuine watermarks is recommended. E.S.

WELDING

THOMAS, DORSEY BLALOCK. Oxyacetylene in paper mill maintenance. Tappi 36, no. 7: 38A, 40A, 42A, 44A (July, 1953).

Oxyacetylene equipment has been found useful in such maintenance work as reclaiming material, hard-surfacing, and rebuilding production equipment at the Savannah, Ga. plant of Union Bag & Paper Corp. 17 illustrations of equipment being repaired by the oxyacetylene method. E.S.

WET STRENGTH

WALSH, JOHN M. Wet-strength papers open new vistas. Paper Trade J. 136, no. 26: 14-17 (June 26, 1953); Paper & Paper Products 94, no. 19: 1, 6-7 (June 20, 1953); Paper Mill News 76, no. 26: 10 (June 27, 1953); Southern Pulp Paper Mfr. 16, no. 7: 14, 123 (July, 1953); Tappi 36, no. 8: 114-16A (August, 1953).

Reference is made to an exhibition held in New York by the Paper Chemicals Department of American Cyanamid Co. in conjunction with more than 20 paper mills and paper goods manufacturers. The diversified paper products shown (bathing suits, rain capes, pillow cases, blanket covers, kitchen aprons, baby bibs, duck decoys, etc.) had one quality in common—i.e., their strength had been increased by the addition of a melamine resin (Melostrength). The history of the development is outlined briefly, and the properties of treated paper are discussed. 16 illustrations in the first, 1 in the second and fourth, and 2 in the third and fifth reference. E.S.

WHITE WATER

SIMPSON, R. W., DUKE, E. T., and THOMPSON, K. Asbestos paper wastes treatment. Water & Sewage Works 99: 286-91 (1952); Water Pollution Abstr. 26, no. 5: 134 (May, 1953). [Abstract only available]

An account is given of pilot-plant studies made at a mill manufacturing asbestos paper and board to determine the best method to treat excess white

water so that it can be either re-used or discharged to the Schuylkill River without nuisance. Both vacuum and pressure filters gave satisfactory effluents, but the cost of equipment, space requirements, and amount of attention needed would make full-scale operation uneconomical. Tests on sedimentation with and without the use of coagulants showed that two-stage sedimentation with the addition of alum and activated silica at the second stage produced the best effluent. In tests on high-rate flocculation and sedimentation waste waters were treated in an Accelator. With a rate of flow of 5 gal./minute, the suspended matter was reduced from 1910 p.p.m. to 50.1 p.p.m. Higher reductions were possible with longer retention periods and the addition of coagulants. The over-all average efficiency of removal for a 10-day period was, for B.O.D. 47.5%, for turbidity 89.9%, for total solids 74.5%, and for suspended solids 95.8%. Both the effluent and sludge from the Accelator could be re-used. A Cyclator has now been installed for full-scale operation. E.S.

WRIGHT, J. HOWARD. The operation of an OCO water system on a board mill's white water. Tappi 36, no. 7: 122-4A (July, 1953); *cf.* B.I.P.C. 22: 364.

This is essentially the same article as the previous reference. 2 tables. E.S.

WOOD

CHATTAWAY, M. MARGARET. The sapwood-heartwood transition. Australian Forestry 16, no. 1: 25-34 + 3 plates (1952).

The transition from sapwood to heartwood in certain species is described in detail, and the formation of intermediate wood discussed. The distinction between sapwood and heartwood cannot always be clearly made on the basis of color, or on the presence of starch or tyloses, but must be based on the fundamental change which lies behind these other features—the death of the cells of the vertical parenchyma and the rays. Some Australian timbers have a sharply defined heartwood, others have no heartwood, others have a band of intermediate wood, which is sapwood, but approaches heartwood in some features. The formation and characteristics of this intermediate wood are described for three species, *Nothofagus cunninghamii* Oerst, *Sloanea woollsii* F. Muell., and *Diospyros pentamera* F. Muell. An explanation is offered of the paradox that the death of sapwood cells in the living tree causes changes that result in the formation of heartwood, but that these changes do not take place with the death of the sapwood cells on felling or when the whole tree dies. 9 figures and 6 references. E.S.

KRÖNER, KARL, and PUNGS, LEO. Behavior of the dielectric loss factor of natural wood in the high-frequency range. Holzforschung 7, no. 1: 12-18 (1953). [In German; English summary] *cf.* B.I.P.C 23: 56.

The woods examined were red beech (in block and meal form), spruce, oak, and pine (the latter in the form of meal). The previous work, in the frequency range of 3×10^5 to 10^9 cycles/second, was extended to include measurements of the dielectric losses. As indicated previously, the anisotropy originates in the original (macroscopic) wood structure. The occurrence of a maximum loss factor at a specific frequency (about 10^7 cycles/second) is ascribed to the dipole nature of the cellulose. In moist wood the displacement of this maximum to higher frequencies is explained by the sorption of water between cellulose chains. At low frequencies the influence of moisture is probably coupled with an "inhomogeneity effect" in the sense of Wagner's

theory of dielectric losses (*cf.* Ann. Physik IV, 40: 817 [1913]). 1 table, 7 figures, and 26 references. L.E.W.

WOOD—CHEMISTRY

BRISSAUD, L., and RONSSIN, S. Study of the chemistry of wood and wood pulps by means of nitration. Assoc. tech. ind. papetière, Bull. no. 4: 107-17 (1953). [In French]

Sprucewood sawdust (I) was nitrated readily using an acetic acid-acetic anhydride-nitric acid mixture (similar to that described by Brissaud in Mém. services chim. état 30: 120-32 [1943]), four hours at 0°C. (with a maximum temperature of 6°), followed by immersion in ice water, thorough washing, and cautious drying. The crude product (II), obtained in 97% yield, contained 11.75% nitrogen, and showed only 10% solubility in acetone (indicating marked differences from nitrated wood cellulose). (II) was extracted successively (*a*) with boiling methanol, (*b*) with cold acetone, and (*c*) with boiling water; this extraction cycle was repeated several times, using increasing time periods for the water extraction. Separations by means of (*a*), (*b*), and (*c*) were far from quantitative, and much of (II) was lost. The average D.P. after the first water extraction was 1377, but this dropped after 123 hours to 393. The various extractives were weighed and analyzed for nitrogen. When (II) was heated for shorter time periods with water at 125°, the D.P. after 13.5 hours was 133. Water or autoclaving caused hydrolysis of esters in (II), freeing nitric acid, which caused extensive oxidation of lignin and cellulose degradation. Lignin derivatives in (II) could also be removed by chloriting. In the original (II), most of the nitrogen is present in $-ONO_2$ (ester) form, but about 2% is in the form of nitro groups, thus indicating that aromatic nuclei in (I) might be present. On the other hand, the typical bands of the phenyl group were absent from the infrared spectra, which showed the nitro groups. (II), when delignified with sodium chlorite gave a nitrocellulose whose D.P. was over 1200, and the suggestion is made that the preliminary nitration of woods may serve in determining the D.P. of native wood cellulose. Methods for determining nitrogen are discussed in some detail. 7 tables, 1 figure, and 13 references. L.E.W.

WOOD—EXTRACTIVES

JONES, J. K. N. Larch ε-galactan. Part II. The isolation of 3-β-L-arabopyranosyl L-arabinose. J. Chem. Soc.: 1672-5 (June, 1953); *cf.* B.I.P.C. 19: 57.

Graded hydrolysis of the ε-galactan from larchwood with 0.01 *N* hydrochloric acid at 100°C. for 1.5 hours, followed by the removal of the acid, precipitation of the degraded galactan with alcohol, and evaporation of the filtrate gave, after fractionation on a cellulose column, 3-β-L-arabopyranosyl-L-arabinose (I) $[\alpha]_D + 220$ (±10°), characterized by means of an osazone melting at 235°. On methylation (I) gave a hexamethyl derivative, which when hydrolyzed gave 2,3,4-trimethyl-L-arabinose and 2,4-dimethyl-L-arabinose. Thus, as in the case of sapote gum (*cf.* B.I.P.C. 23: 485), larch galactan also contains arabinose units in the pyranose form. (I) could not have been formed by resynthesis. This was shown by heating pure arabinose solution with 0.01 *N* hydrochloric acid at 100° for 1.5 hours. No oligosaccharides were formed. Gum arabic, hydrolyzed with *N* hydrochloric acid at room temperature for 21 days gave rise to rhamnose, arabinose, galactose, and various oligosaccharides. One disaccharide isolated from the mixture contained only arabinose units; the other (whose osazone melted at 240°) was probably 3-α-D-galactopyranosyl-L-arabinose. L.E.W.

THOMPSON, JAMES O., BECHER, JOSEPH J., and WISE, LOUIS E. A physicochemical study of a water-soluble polysaccharide from Douglas-fir (*Pseudotsuga taxifolia*). Tappi 36, no. 7: 319-24 (July, 1953).

A brief study has been made of some molecular properties of a cold water-soluble polysaccharide system isolated under mild conditions and in a yield of 0.8% from the heartwood of a 107-year-old Douglas-fir. Paper chromatography of the hydrolyzate showed the presence of galactose, arabinose, and xylose, and traces of acidic material; the weight ratio of galactan to araban to xylan was 90:9:1. The aqueous solution has a pH of 7, $[\alpha]_D + 19°$, and an intrinsic viscosity of 0.28. Osmotic-pressure measurements on the aqueous solution indicated a number average D.P. of 340; similar measurements on an acetate (degree of substitution about 2) in methyl ethyl ketone indicated a number average D.P. of 425. Osmotic-pressure measurements in methyl Cellosolve, dioxane, and chloroform indicated molecular association in these solvents. Viscosity studies suggested that the polysaccharide is less highly branched than the arabogalactan of larch. Chain degradation was shown to occur slowly in aqueous solution at 30°C. in the presence of air, and rapidly at 100° in the presence of air or in an atmosphere of nitrogen. Hot-water treatment of the fibrous residue which remained after the cold-water extraction was shown to remove appreciable amounts of carbohydrate material including units of glucose and mannose in addition to those of galactose, arabinose, and xylose. The pH of the extract was about 3; it was considered probable that acid hydrolysis of cell wall components had occurred. The dangers attending a hot-water "extraction" are discussed briefly. 2 tables, 4 figures, and 23 references.

E.S.

Patent Section

Although the abstracts of the United States and Canadian patents are prepared from the patents themselves, the initial selection of the patents to be abstracted is made from the Patent Gazette *and the* Canadian Patent Office Record *and, therefore, it is possible that the patent section will not contain all patents of potential interest to the industry. In so far as possible, an attempt will be made to indicate patents issued in both countries.*

The patent abstracts are listed under the various headings currently used for the abstracts of periodical articles.

Printed copies of United States patents can be obtained from the Commissioner of Patents, Washington, D.C.; the price is 25 cents per copy. Canadian patents up to and including December, 1948, are available only as manuscripts or photostatic copies, and an estimate of the cost of a patent should be obtained from the Commissioner of Patents, Ottawa, Canada, in advance of the order. With January, 1949, printed copies of Canadian patents are available at 25 cents per copy of less than 50 sheets of printed matter. For patents of 50 sheets or over, the price is $1.00 per copy. Beginning with volume 21, the Canadian patents will be abstracted from the complete specifications.

ADHESIVES

HERITAGE, CLARK C. Adhesive compositions. Canadian patent 493,755. Filed May 17, 1947. Issued June 16, 1953. 18 claims. Assigned to Weyerhaeuser Timber Company.

A process for the preparation of resinous products for use in adhesive compositions (e.g., for plywood) comprises reacting finely divided vegetable material, such as tree bark or nut shells, with an aqueous sodium hydroxide solution at about 185°F. for 20 minutes and drying the resulting reaction product. This is the same as U. S. patent 2,547,785 (Nov. 13, 1951); *cf.* B.I.P.C. *22*: 290. W.B.W.

HERITAGE, CLARK C. Phenolic adhesive composition. Canadian patent 493,754. Filed Nov. 25, 1946. Issued June 16, 1953. 16 claims. Assigned to Weyerhaeuser Timber Company.

An adhesive composition which is suitable for use in the manufacture of plywood comprises 80-100 parts of phenol-aldehyde (e.g., phenol-formaldehyde or -acetaldehyde) resin solution containing about 50% resin solids and, as an adhesive constituent, the reaction product obtained by the combination of 20 parts of comminuted bark (e.g., from white, western yellow, southern, or sugar pine), 40 to 50 parts of water, 5 parts of potassium carbonate, and 4 parts of potassium hydroxide. This is the same as U. S. patent 2,574,784 (Nov. 13, 1951); *cf.* B.I.P.C. *22*: 448. W.B.W.

SCHOEN, WILLIAM. Process of making adhesive from lignocellulose. U. S. patent 2,643,953. Filed July 1, 1949. Issued June 30, 1953. 8 claims. Assigned to Masonite Corporation. [Cl. 106-163]

Water-soluble lignocellulose material (Masonoid) is concentrated and dried; the dried product is slurried with methanol; most of the methanol is removed; acetone, ethyl alcohol, or a similar solvent is used to remove all traces of methanol; and the product is dried. This treated material does not

have the disadvantage of the untreated material of being hygroscopic and losing strength under conditions of high or low humidity. W.B.W.

VOGELSANG, GEORGE K. Resinous composition comprising phenol-aldehyde and ketone-aldehyde condensation products. U. S. patent 2,629,703. Filed June 2, 1948. Issued Feb. 24, 1953. 16 claims. Assigned to The Borden Company. [Cl. 260-43]

Selected ketone-aldehyde and potentially reactive phenol-aldehyde condensation products are mixed together to form a solution which may be cured quickly at 212°F. with an alkaline catalyst to an infusible resin of great strength. These resins are useful for impregnating paper and textiles, as adhesives, and as bonding agents. W.B.W.

ALKALINE PROCESSES—RECOVERY

ARIES, ROBERT S., and POLLAK, ARTHUR. Process for dissolving ash containing sodium sulfide and sodium carbonate. U. S. patent 2,642,399. Filed Feb. 23, 1949. Issued June 16, 1953. 3 claims. [Cl. 252-183]

The recovery of pulping chemicals after burning black liquors from either the sulfate or the neutral sulfite process is accomplished by dissolving the smelt to make green liquor. Molten ash is added to a large circulating body of concentrated sodium sulfide having limited solubility for sodium carbonate and sodium sulfate. Water is added continuously as the molten ash is dissolved and concentrated sulfide solution is withdrawn. The carbonate and sulfate settle out in crystalline form and are easily separated from the sulfide solution. Small additional quantities of sodium sulfide may be recovered from the carbonate sludge by washing with fresh water before sulfiting or other treatment. 2 figures. W.B.W.

BARKERS AND BARKING

LEFFLER, NILS G. Method of and a machine for barking logs. Canadian patent 493,924. Filed Nov. 7, 1946. Issued June 23, 1953. 11 claims. Assigned to Svenska Cellulosa Aktiebolaget.

A reciprocating barking member of a mechanical barker is a flexible element (such as a chain, wire, or the like), which is adapted to follow smoothly the contour of a log. This is the same as U. S. patent 2,576,127 (Nov. 27, 1951); *cf.* B.I.P.C. 22: 367. 16 figures. W.B.W.

PEARCE, JOHN H. Log debarker and chipper. U. S. patent 2,642,904. Filed Feb. 6, 1951. Issued June 23, 1953. 6 claims. [Cl. 144-208]

A portable unit for debarking and chipping logs is claimed. Cutters mounted on a chain remove the bark as the log is moved past the location of the cutting head. Chain-type conveyors deliver the log to the cutter and rotate the log as required to bring all surfaces in contact with the cutter. If desired, after the barking operation, the same cutters may be employed to chip the log into chips suitable for pulping or fuel. 10 figures. W.B.W.

ROCKWOOD, ARTHUR G. Hydraulic log debarker. U. S. patent 2,643,691. Filed April 9, 1952. Issued June 30, 1953. 7 claims. Assigned to Worthington Corporation. [Cl. 144-208]

The nozzles on this debarker are controlled by an electric control panel so that the proper set and number of nozzles may be operated in accordance with the diameter of the log. Displacement of the logs during debarking is prevented by an endless chain, flexibly mounted, which engages the top of the log near the area of contact with the streams of water. 16 figures.
W.B.W.

BOARD

TOWER, GORDON E. Process of forming artificial board. U. S. patent 2,643,186. Filed April 10, 1948. Issued June 23, 1953. 2 claims. Assigned to Chapman Forest Utilization, Inc. [Cl. 92-21]

A strong, rot-resistant fiberboard is formed by the treatment of fibrous plant material with an alkaline solution of a thermosetting phenol-formaldehyde intermediate condensation product containing 3.5% resin solids on the fiber basis. The fibers are formed into a mat, then subjected to heat and pressure to form a dense board product. This is the same as Canadian patent 471,302 (Feb. 6, 1951); *cf.* B.I.P.C. 21: 505-6. W.B.W.

BOARD—COATED

BRINK, EDWIN H. Roller coating machine for rigid sheet material. U. S. patent 2,642,030. Filed July 28, 1949. Issued June 16, 1953. 8 claims. Assigned to Masonite Corporation. [Cl. 118-114]

Hardboard and similar material with rough surfaces and nonuniform caliper may be coated on this machine which features a driving roll, an applicator roll, and a wiping roll fitted with a doctor blade. Each of these rolls is opposed by a compression-loaded roll whose exterior is covered with a resilient material such as rubber. Excess coating is removed from the board by the wiping roll which rotates in a direction opposite to that of board travel and at a different speed. A smooth coating of uniform appearance results. 8 figures. W.B.W.

BOARD—SPONTANEOUS COMBUSTION

FUQUA, MACK C. Polymer treatment for fiberboards. U. S. patent 2,643,200. Filed Aug. 16, 1950. Issued June 23, 1953. 4 claims. Assigned to Standard Oil Development Company. [Cl. 117-59]

A polymer useful in printing inks and as a drying oil is produced by passing a steam-cracked hydrocarbon fraction over clay at 200 to 500°F. The yield of the polymer varies from 1 to 10% depending upon conditions. Treatment of the polymer with elemental sulfur to reduce the unsaturation makes the material suitable as an impregnating agent for laminated board and paper and fiberboards. Danger from spontaneous combustion in sulfur-treated boards is eliminated after an adequate curing period. The addition of a small amount of antioxidant (i.e., 2,2-hydroxy phenol propane or phenyl-β-naphthylamine) will prevent the spontaneous temperature rise of the treated boards. 2 figures. W.B.W.

BOARD, CORRUGATED

CHITTICK, CHARLES Y. Flexible corrugated sheet material and method of fabricating same. U. S. patent 2,642,372. Filed Feb. 2, 1950. Issued June 16, 1953. 11 claims. [Cl. 154-55]

Single-faced corrugated board is cut across the ridges of the corrugations at controlled intervals. This makes the board flexible perpendicular to as well as parallel to the direction of the flutes. 6 figures. W.B.W.

BOARD, FIREPROOF

NIELSEN, MORRIS L. Fire-retarding coating composition composed of nitrogen-phosphorus compound with an aldehyde resin. U. S. patent 2,642,405. Filed Dec. 30, 1948. Issued June 16, 1953. 5 claims. Assigned to Monsanto Chemical Company. [Cl. 260-29.4]

A water-insoluble polyphosphorylamide compound is formed by the reaction of phosphoryl chloride with anhydrous ammonia in a hydrocarbon solvent. This material is included in paint to form a self-extinguishing composition when applied to fiberboard, paper, cloth, and the like. W.B.W.

BOARD, WAXED

RUMBERGER, GEORGE G. Method of coating sheet material with wax. U. S. patent 2,642,366. Filed March 23, 1951. Issued June 16, 1953. 17 claims. Assigned to Marathon Corporation. [Cl. 117-103]

High-speed, hot-melt wax coating is achieved without characteristic flow lines (crow's feet) by plunging the sheet into an aqueous cooling bath whose surface tension is adjusted by the addition of a wetting agent so that it is close to the surface tension of the coating material. Isopropyl alcohol, ethyl alcohol, a mixture of alcohols, or sulfonated alcohols are suitable wetting agents for this purpose. W.B.W.

BOARD SPECIALTIES

FROST, ORCUTT W., and CONOVER, JAMES H. Concrete form lining material. Canadian patent 494,031. Filed Oct. 18, 1946. Issued June 30, 1953. 13 claims. Assigned to Canadian Gypsum Company Limited.

A well-sized fibrous insulation-type board, 0.5-inch thick, is treated on the side intended to contact the concrete (I) with a dilute aqueous emulsion of sodium hydroxide, an aldehyde (formaldehyde or furfural), and a wetting agent (Du Pont MP 189 is recommended), whereby the sizing is neutralized to a depth of 3/32 of an inch. (I) is thereby rendered absorptive, whereas the remainder of the board is stiff and well-sized. The aldehyde in (I) acts as an antisticking agent for the concrete. The controlled absorption of water from the concrete provided by this board results in a harder surface with fewer air pockets. W.B.W.

HUMPHREYS, JOSEPH A. Multiple utility clamp and bracket. U. S. patent 2,643,046. Filed Jan. 13, 1949. Issued June 23, 1953. 2 claims. [Cl. 229-6]

Two slots in this bracket (made of metal, wood, plastic, or paper) leave a central finger which opposes the outer members. A portion of the clamp is bent at right angles and has slots for holding screws, nails, etc. The clamp may be used for holding a toothbrush, a knife, or similar articles. 10 figures. W.B.W.

KOMEO, OSCAR. Sanitary milk carton. U. S. patent 2,643,815. Filed Jan. 26, 1951. Issued June 30, 1953. 2 claims. [Cl. 229-44]

A one-piece blank is formed into a carton having a truncated pyramidal top section with a flanged pouring lip which is completely covered by an overlapping lid. A liquid seal between the lid and the body of the carton is ensured by the wax coating material. 8 figures. W.B.W.

LIEBOWITZ, BENJAMIN. Insert boards. Canadian patent 493,447. Filed July 22, 1952. Issued June 9, 1953. 6 claims.

This is the same as U. S. patent 2,630,948 (March 10, 1953); *cf.* B.I.P.C. 23: 596. 19 figures. W.B.W.

O'REILLY, JOSEPH A. Interlocked hinged closure. U. S. patent 2,643,047. Filed May 1, 1948. Issued June 23, 1953. 1 claim. Assigned 50% to William P. Hooker. [Cl. 229-44]

Interlocking connections are made in paperboard, corrugated board, and similar flexible materials by slits cut into the members to be connected. A tongue is formed by an arcuate-shaped slit (I) in one member and a receiving slot (II) in the opposing member. By interengagement of (I) and (II)—so that the stresses are in opposite directions—a locked closure is obtained. 9 figures. W.B.W.

VOGEL, LAWRENCE E. Disposable pallet. U. S. patent 2,643,080. Filed April 19, 1949. Issued June 23, 1953. 3 claims. Assigned to Arkell and Smiths. [Cl. 248-120]

A pallet comprises a corrugated-board web with a series of transverse grooves in which cylindrical paper tubes reinforced by wooden end plugs are positioned. Metal straps encircling the grooves hold the tubular elements in place. 4 figures. W.B.W.

CELLULOSE ESTERS

PAIST, WALTER D. Purification of cellulose propionate. Canadian patent 493,948. Filed Oct. 31, 1947. Issued June 23, 1953. 4 claims. Assigned to Camille Dreyfus.

A fraction of cellulose propionate (I), which is responsible for the blush in films and molded articles, may be removed by dissolving (I) in acetone, then precipitating distinct fractions by the addition of controlled amounts of precipitant comprising an aqueous solution of ethyl alcohol. The second precipitate so removed comprises 70 to 80% of the original (I) in solution and is the blush-resistant fraction. W.B.W.

CELLULOSE ETHERS

MATTER, MAX. Process for the manufacture of a pulverulent alkyl cellulose coated upon a pulverulent carrier. U. S. patent 2,631,943. Filed Aug. 13, 1948. Issued March 17, 1953. 3 claims. Assigned to Ciba Limited. [Cl. 106-193]

Spraying solutions and dusting preparations (for plants, seeds, etc.) have improved suspension and surface-active properties when prepared by mixing an alkylcellulose precipitated upon a carrier such as kaolin, then grinding the dried mass to a fine powder. W.B.W

COMBINATION PACKAGES

FREEMAN, CLAUDE C. Carton for commodities and premium dis-

play. U. S. patent 2,642,988. Filed Aug. 31, 1950. Issued June 23, 1953. 1 claim. Assigned to Container Corporation of America. [Cl. 206-45.14]

Cut-out portions in the side wall of the carton allow display of the premium offered with the merchandise included in the carton. A paperboard holder is fitted into the carton to hold the premium item in position so that it can be viewed through the carton cut out. 12 figures. W.B.W.

DECULATOR PROCESS

CLARK, CARLETON L., VICARIO, CARLO, LYONS, CORNELIUS J., SMITH, JAMES A., and HICKEY, WILLIAM W. Deaerating a suspension of cellulosic fibers. U. S. patent 2,642,950. Filed Nov. 30, 1951. Issued June 23, 1953. 12 claims. Assigned to The Rotareaed Corporation. [Cl. 183-2.5]

Papermaking stock before going to the paper or board machine is sprayed through special double-orifice nozzles and strikes impingement plates within a tank maintained at subatmospheric pressure; the deaerated stock collects in the pool in the lower half of the tank. Nozzles and tank are so constructed that no stock collects on the interior surfaces of the tank. 7 figures. W.B.W.

DE-INKING

HILL, HAROLD S., and COGHILL, JAMES T. Method for processing fibrous pulp. U. S. patent 2,641,164. Filed July 8, 1946. Issued June 9, 1953. 18 claims. [Cl. 92-20]

Deinking, dewatering, fractionating, and removing soluble materials from pulp is claimed by this process (i.e., Curlation). The pulp is formed under compression into small discrete nodules by the gyratory action of two opposing surfaces which forces the pulp nodules to roll tractively and traversingly between said surfaces, while also allowing water to escape from, or forcing water through the nodulated mass; the washing, fractionating, and removal of insoluble particles (e.g., inks) is achieved with a small volume of water. This is similar to Canadian patent 465,565 (March 30, 1950); *cf.* B.I.P.C. 20: 827. 3 figures. D.H.

DISPENSING CONTAINERS

BROEREN, FRANK L. Dispensing package. Canadian patent 493,545. Filed Nov. 25, 1952. Issued June 9, 1953. 7 claims. Assigned to Marathon Corporation.

This is the same as U. S. patent 2,624,521 (Jan. 6, 1953); *cf.* B.I.P.C. 23: 452. 12 figures. W.B.W.

FLAX

WELLS, SIDNEY D. Production of fiber from flax straw. U. S. patent 2,641,541. Filed Sept. 13, 1949. Issued June 9, 1953. 4 claims. Assigned to The Institute of Paper Chemistry. [Cl. 92-15] *cf.* B.I.P.C. 23: 635.

Flax fiber is produced from seed flax by mechanically working the straw into tow or fluff. The tow is then given successive soaking periods totaling 48 to 96 hours in dilute caustic soda at less than 80°F., beaten to separate

the fibers, and washed in conventional papermaking equipment. Shive can be removed by a centrifugal-type separator. Fibers so treated are not degraded and after bleaching are suitable for the highest grades of paper. W.B.W.

FOLDING BOXES

BOLDING, HUBERT V. Display carton. U. S. patent 2,643,811. Filed April 14, 1949. Issued June 30, 1953. 3 claims. Assigned to The Bradley & Gilbert Company. [Cl. 229-27]

Two adjacent side walls of the carton are connected by an opening extending across a corner which is backed by a utility panel; the opening may be covered with a transparent window of plastic. The panel serves the dual function of providing a three-dimensional effect when printed and also positions the product (i.e., bottle) within the carton. 12 figures. W.B.W.

BRADLEY, HARRY. Carton for round-ended articles. U. S. patent 2,643,814. Filed Oct. 17, 1949. Issued June 30, 1953. 1 claim. Assigned to John Waddington Limited. [Cl. 229-37]

This carton (for such articles as electric light bulbs) contains an end portion which, when folded back into the carton and erected, forms inwardly projecting supports upon which the article may rest. At the opposite end, a hinged flap of each face of the carton projects inwardly to engage and hold the small end of the bulb. 4 figures. W.B.W.

CURRIVAN, JOHN F. Integral carton for protection of fragile articles. U. S. reissue patent 23,670. Filed March 30, 1953. Issued June 23, 1953. 9 claims. [Cl. 229-38]

This is a reissue of U. S. patent 2,611,529 (Sept. 23, 1952); *cf.* B.I.P.C. 23: 141. 10 figures. W.B.W.

PLATT, SAMUEL. Folding box locking structure. U. S. patent 2,642,218. Filed Feb. 16, 1948. Issued June 16, 1953. 3 claims. [Cl. 229-31]

A folding box for cakes, cookies, and like articles has locking tabs formed in the front wall which may be engaged with the adjacent side walls to lock the front wall in place when the cover is open. 5 figures. W.B.W.

WEISS, ARTHUR J. Method of making cartons and carton blanks. U. S. patent 2,643,589. Filed Sept. 19, 1950. Issued June 30, 1953. 5 claims. Assigned to Robert Gair Company, Inc. [Cl. 93-36]

Duplex end flaps are formed from a single carton blank by folding the flaps back on themselves, sealing the edge of the flap to the carton blank with wax or similar material, and then severing a narrow strip of board at the crease to form the double flap. A tight closure is made possible for such uses as freezer cartons, etc. by the double-end flap construction. 14 figures. W.B.W.

GLUE AND GELATINE

FENCIL, LOUISE K. Liquid glue. U. S. patent 2,643,194. Filed Nov. 18, 1946. Issued June 23, 1953. 5 claims. Assigned to Armour and Company. [Cl. 106-135]

The addition of a halogenated alcohol to animal glue reduces the gelling tendency. This makes heating of the glue unnecessary and also increases the working life of the glue. Ethylene chlorohydrin has been found especially suitable. W.B.W.

GUMS AND RESINS

RAMSTAD, PAUL E., and ANKER, CHARLES A. Precipitation of mannogalactans and glucomannans from aqueous sols. Canadian patent 494,068. Filed Aug. 6, 1946. Issued June 30, 1953. 4 claims. Assigned to General Mills, Inc.

Purification of these gums (obtained from seeds of locust bean, guar, etc. or corms of plants of the *Amorphophallus* species) is achieved by dispersal in a dilute aqueous sol, causing the sol to gel, precipitating the gum from the gel, and recovering the gum. Calcium, magnesium, and cupric salts may be used for the precipitation. W.B.W.

INSULATION AND INSULATING MATERIALS

PARKER, LEON. Method of producing batts of silica fibers. U. S. patent 2,643,487. Filed March 23, 1951. Issued June 30, 1953. 5 claims. Assigned to The H. I. Thompson Company. [Cl. 49-77]

A method is claimed for interrolling a continuous silica-fiber batt with a lightweight noncrinkled kraft paper (e.g., 30-pound weight) on a mandrel in preparation for the firing stage which stabilizes the batt and sets the resin-bonding agent. The lightweight paper produces a white, soft, and not too fluffy batt, whereas heavier paper results in a product which tends to be black and brittle. 3 figures. W.B.W.

INTERIOR PACKING

KEISER, GEORGE W., JR., MUISE, HERBERT D., and MILLER, WILLIAM A. Shipping device. U. S. patent 2,642,989. Filed Oct. 17, 1950. Issued June 23, 1953. 11 claims. Assigned to Robert Gair Company, Inc. [Cl. 206-52]

A reel for the shipment and display of heavy materials, such as link chain, is formed from paper or corrugated board. The core is of flattened cross-section, and the side retainers are rectangular in shape. The construction saves shipping and storage space and is much lighter than wooden reels. 5 figures. W.B.W.

PROSSEN, LOUIS F. Carton. U. S. patent 2,642,183. Filed Jan. 25, 1950. Issued June 16, 1953. 8 claims. Assigned to Celanese Corporation of America. [Cl. 206-65]

Bobbins or cones of yarn are held in place by U-shaped pieces of paperboard which are fitted into holes punched in the corrugated separators which divide the package into several layers. These projections engage the tubes or cones and hold them in position in the package. 4 figures. W.B.W.

LOCUST BEAN

FRISCH, NAT, and SWEENEY, FRANK J. Modified locust bean gum, solution thereof, and process for making a locust bean gum solution. U. S. patent 2,644,762. Filed Dec. 16, 1948. Issued July

7, 1953. 10 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 106-208]

This corresponds to Canadian patent 489,879 (Jan. 20, 1953); *cf.* B.I.P.C. 23: 520. W.B.W.

FRISCH, NAT, and SWEENEY, FRANK J. Modified locust bean gum, solution thereof, and process for making a locust bean gum solution. U. S. patent 2,644,763. Filed June 26, 1951. Issued July 7, 1953. 10 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 106-208]

This is very similar to U. S. patent 2,644,762. W.B.W.

FRISCH, NAT, and SWEENEY, FRANK J. Modified locust bean gum, solution thereof, and process for making a locust bean gum solution. U. S. patent 2,644,764. Filed June 26, 1951. Issued July 7, 1953. 10 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 106-208]

This is very similar to U. S. patent 2,644,762. W.B.W.

FRISCH, NAT, and SWEENEY, FRANK J. Modified locust bean gum, solution thereof, and process for making a locust bean gum solution. U. S. patent 2,644,765. Filed June 26, 1951. Issued July 7, 1953. 10 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 106-208]

This is very similar to U. S. patent 2,644,762. W.B.W.

FRISCH, NAT, and SWEENEY, FRANK J. Paper making process utilizing modified locust bean gum. U. S. patent 2,644,749. Filed Dec. 16, 1948. Issued July 7, 1953. 3 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 92-21]

A strong paper sheet is formed from a stock suspension containing locust bean gum, sodium tetraborate, and an acidic substance. This is similar to Canadian patent 477,111 (Sept. 18, 1951); *cf.* B.I.P.C. 22: 212. W.B.W.

FRISCH, NAT, and SWEENEY, FRANK J. Paper making process utilizing modified locust bean gum. U. S. patent 2,644,750. Filed June 26, 1951. Issued July 7, 1953. 3 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 92-21]

This is very similar to U. S. patent 2,644,749. W.B.W.

FRISCH, NAT, and SWEENEY, FRANK J. Papermaking process utilizing modified locust bean gum. U. S. patent 2,644,751. Filed June 26, 1951. Issued July 7, 1953. 3 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 92-21]

This is very similar to U. S. patent 2,644,749. W.B.W.

FRISCH, NAT, and SWEENEY, FRANK J. Papermaking process utilizing modified locust bean gum. U. S. patent 2,644,752. Filed

June 26, 1951. Issued July 7, 1953. 3 claims. Assigned to Stein, Hall & Company, Inc. [Cl. 92-21]

This is very similar to U. S. patent 2,644,749. W.B.W.

MACHINERY—BOARD MACHINES

SALVANESCHI, PINO. Apparatus for the continuous production of cement-fiber sheets. U. S. patent 2,644,373. Filed July 31, 1947. Issued July 7, 1953. 7 claims. [Cl. 92-43]

A cement-asbestos fiber sheet is formed by this machine which comprises a vibrating hopper mounted above a forming drum, a segment of which is maintained at reduced pressure. The cement-fiber mass in a plastic state is spread on an endless wire web or other permeable material on the surface of the drum. The web travels over the surface of the forming drum where the cement is compacted and smoothed by vibrating elements which control the sheet thickness and degree of compaction. Excess liquid in the sheet is removed through the drum in the reduced pressure area. 6 figures. W.B.W.

MACHINERY—CARTON-FEEDING MECHANISM

BAKER, THOMAS R., and PAGENDARM, EDWARD J. Blank magazine for folding box machines. U. S. patent 2,642,285. Filed Oct. 25, 1950. Issued June 16, 1953. 4 claims. Assigned to Bemiss-Jason Machine Co. [Cl. 271-62]

In this machine box blanks are stacked on edge and removed singly by suction cups for feeding to succeeding machines for printing, setup, etc. 5 figures. W.B.W.

JACKSON, DONALD R. P. Suction blank feed for printing, wrapping and other machines. U. S. patent 2,643,120. Filed Nov. 8, 1949. Issued June 23, 1953. 2 claims. Assigned to Molins Machine Company Limited. [Cl. 271-32]

Positioning the sucker cup so that a part of the aperture projects past the edge of the paperboard blanks is claimed to eliminate the occasional problem of feeding more than one blank for each movement of the suction cup. Flexure of the blank into the cup allows air to enter between the sheets so that only the sheet engaged by the sucker is removed. 4 figures. W.B.W.

VAHLE, RAYMOND. Carton feeding machine. U. S. patent 2,642,196. Filed Oct. 18, 1946. Issued June 16, 1953. 9 claims. Assigned to Robert Gair Company, Inc. [Cl. 214-8.5]

Flat folded carton blanks (e.g., for cellular egg cartons) are removed from a hopper, erected, and discharged into a magazine in internested relation. 10 figures. W.B.W.

MACHINERY—CONVERTING MACHINERY

AHLMEYER, HEINZ, and SHERMAN, WHITNEY D. Machine for assembling paperboard partitions. U. S. patent 2,643,590. Filed June 21, 1948. Issued June 30, 1953. 4 claims. Assigned to Robert Gair Company, Inc. [Cl. 93-37]

Crisscross paperboard partitions of the type used to separate Christmas

tree ornaments are set up on a slotted conveyor in proper spaced relationship. The preformed slotted partitions are fed to the machine, and the assembly is continuous and automatic. 10 figures. W.B.W.

BERCH, SAMUEL H. Container flap folding apparatus. U. S. reissue patent 23,669. Filed Jan. 19, 1953. Issued June 23, 1953. 3 claims. Assigned to Arden Farms Co. [Cl. 53-96]

This machine forms the carton from a precut blank, fills it with ice cream, and closes the top of the carton after filling. This is a reissue of U. S. patent 2,500,922 (March 21, 1950); *cf.* B.I.P.C. 20: 609. 27 figures. W.B.W.

BURROUGHS, EDWIN E. Mechanism and method for forming sleeved valve bags. U. S. patent 2,643,588. Filed Sept. 29, 1949. Issued June 30, 1953. 27 claims. Assigned to St. Regis Paper Company. [Cl. 93-8]

The mouth of the bag tube is opened at the valve corner, the supplemental sheet inserted, and the valve corner closed or flattened. Automatic sewing equipment stitches both ends of the bag tube. Bags of various sizes may be handled on this apparatus. 69 figures. W.B.W.

GEFFROY, GEORGES. Carton forming machine. U. S. patent 2,643,592. Filed May 6, 1950. Issued June 30, 1953. 1 claim. Assigned to La Cellophane. [Cl. 93-51]

A machine for making folded rectangular open-top boxes with a cellophane liner for food products or the like is claimed. The liner is formed in such a fashion that no open seams extend below the level to which the carton is to be filled. 7 figures. W.B.W.

GILCHRIST, JOHN. Apparatus for forming and assembling egg cartons. U. S. patent 2,642,786. Filed Nov. 26, 1949. Issued June 23, 1953. 24 claims. Assigned to Robert Gair Company, Inc. [Cl. 93-37]

Cartons in the knocked-down form for shipment are assembled by inserting the cross partitions in the carton body. An electrical control means is provided whereby the entire apparatus is stopped if any fouling or jamming occurs in feeding the cross partitions into the carton body. 76 figures. W.B.W.

GOODRICH, THEODORE W. Beading roller for cartons. U. S. patent 2,642,783. Filed Dec. 6, 1951. Issued June 23, 1953. 2 claims. [Cl. 93-36.5]

As paper- or corrugated-board cartons are set up, this device forms a bead in the board at the fold lines of the bottom flaps. Resistance to fold is broken, and the board does not tend to spring back to the original position. 3 figures. W.B.W.

HASKELL, HERBERT T. Paper padding press. U. S. patent 2,641,781. Filed July 8, 1952. Issued June 16, 1953. 2 claims. [Cl. 11-1]

Sheets are aligned in a right-angled V trough prior to pressing and gluing

into tablets. The device is capable of handling a large variety of sheet sizes without the use of special fillers. 8 figures. W.B.W.

KLOPFENSTEIN, JESS D. Machine for applying decal films to base sheets. U. S. patent 2,643,475. Filed April 22, 1950. Issued June 30, 1953. 7 claims. Assigned to The Meyercord Company. [Cl. 41-1]

The machine is particularly adapted for the application of decalcomania transfers by heat and pressure to base sheets of wood, fibrous materials, etc. A large, rubber-covered roll is opposed by a smaller steel roll which is heated and equipped with a clutch. The clutch in the smaller roll allows it to assume the same surface speed as the large roll, as the sheet material is passed through the nip. 6 figures. W.B.W.

LIENART, MARCEL. Multi-ply bag tubing machine. Canadian patent 493,570. Filed May 19, 1949. Issued June 9, 1953. 14 claims. Assigned to St. Regis Paper Company.

A machine is adapted for the manufacture of multiwall paper tubes for stepped-end bags. The tubes are subsequently formed into finished bags on a bottoming machine. This is the same as U. S. patent 2,581,801 (Jan. 8, 1952); *cf.* B.I.P.C. 22: 458. 38 figures. W.B.W.

OVERLAND, LEO D., and LEVINE, JACK W. Automatic means for making special cardboard containers. U. S. patent 2,643,591. Filed Feb. 15, 1950. Issued June 30, 1953. 1 claim. [Cl. 93-49]

A roll press for forming a special channel in the side of the carton for ice-cream sandwiches, etc. consists of two pairs of matched rolls which first press a rounded channel into the paperboard, then form the channel with beveled shoulders. The rolls are heated and form a bend greater than that desired in the final channel. 25 figures. W.B.W.

SAUERMAN, ERNST C. Envelope machine. U. S. patent 2,643,594. Filed Oct. 28, 1950. Issued June 30, 1953. 6 claims. [Cl. 93-62]

A machine for making end-opening envelopes is claimed, which scores and folds the blanks, applies adhesive, and folds the flaps to form the complete envelope. 7 figures. W.B.W.

STRAW, CLAYTON. Machine for making paper boxes. U. S. patent 2,641,973. Filed Sept. 15, 1945. Issued June 16, 1953. 27 claims. Assigned to Henry R. Davis, Jr. [Cl. 93-41]

A fully automatic machine for setting up flat box blanks and applying staying strips coated with either a heat-sealable material or glue is claimed. Adjustments for various sizes of boxes may be made in five or six minutes, thus making the machine useful for short runs. Very small boxes (e.g., one inch square) may also be handled with no assistance from the operator. 29 figures. W.B.W.

WILLIAMSON, OSCAR H. Box assembling machine. U. S. patent 2,643,378. Filed May 11, 1951. Issued June 30, 1953. 2 claims. Assigned to International Paper Company. [Cl. 1-11]

A machine is claimed for aiding in the assembly and stitching alignment of semiassembled box sections comprising inner and outer telescoping sleeves, a cap, and in some cases an inner end pad. 7 figures. W.B.W.

WITTKUHNS, BRUNO A., NUTTING, H. GEORGE D., and HILL, GILBERT F. Machine for making paper containers. U. S. patent 2,642,784. Filed April 6, 1949. Issued June 23, 1953. 33 claims. Assigned to National Paper Bottle Co. Inc. [Cl. 93-39.3]

A machine for making paper bottles for milk and other free-flowing materials forms precut blanks about a shaped mandrel. An arcuate-shaped blank and a rectangular blank are fed to the forming mandrel simultaneously and wound into an adhesively laminated two-layered body having a cylindrical base and truncated conical top. The bottom disk is formed and inserted into the carton body after removal from the forming mandrel. This bottle may be filled on the same machinery normally employed for filling glass bottles. 58 figures. W.B.W.

WITTKUHNS, BRUNO A., NUTTING, H. GEORGE D., and HILL, GILBERT F. Machine for making paper containers. U. S. patent 2,642,785. Filed April 6, 1949. Issued June 23, 1953. 32 claims. Assigned to National Paper Bottle Co. Inc. [Cl. 93-36.5]

This machine is similar to that described under U. S. patent 2,642,784. 32 figures. W.B.W.

MACHINERY—CURLATOR

COGHILL, JAMES T., and HILL, HAROLD S. Apparatus for treating wood pulp. U. S. patent 2,646,728. Filed Oct. 25, 1946. Issued July 28, 1953. 8 claims. Assigned to Curlator Corporation. [Cl. 92-26]

An apparatus (trade name Curlator) for the continuous treatment of papermaking pulp consists of two opposing tractive working surfaces separated by a relatively thin working space; one surface gyrates and compresses high-density pulp against the other surface, so that the pulp is rolled tractively and transversingly. Excellent defibering and increased tear strength are claimed, with only a low freeness drop and very low expenditure of power. This is similar to Canadian patent 465,518 (May 30, 1950); *cf.* B.I.P.C. 20: 831. 17 figures. D.H.

MACHINERY—CUTTERS

MILES, WILLIAM S. Apparatus for cutting sheet material. U. S. patent 2,643,720. Filed May 27, 1948. Issued June 30, 1953. 4 claims. Assigned to Johns-Manville Corporation. [Cl. 164-73]

This apparatus serves for cutting hard frangible materials, such as asbestos cement board and the like. A channel-shaped frame supports the material and, at the same time, provides a track for the arcuate-shaped cutting knife. The knife opposes the frame members to apply shearing force to the board. 14 figures. W.B.W.

OELKRUE, WILLARD L. Means for cutting the wrapper from rolls of newsprint and the like. U. S. patent 2,643,716. Filed Dec. 4, 1950. Issued June 30, 1953. 4 claims. [Cl. 164-39]

The roll of paper is supported on rollers which position it with respect to a pair of knives which simultaneously cut the circular header from both ends as the roll is turned. A saw, accurately adjusted for depth of cut, severs the cylindrical part of the wrapper. Damage to the roll is eliminated by the use of this machine. 5 figures. W.B.W.

MACHINERY—DECORTICATING MACHINE

VONDERS, KAREL. Method and machine for removing fibers from plant stems. U. S. patent 2,641,803. Filed Feb. 16, 1948. Issued June 16, 1953. 35 claims. Assigned 80% to Jacobus Nolten, and 20% to Willem F. H. Zegers. [Cl. 19-13]

Bast fibers are separated from pith and other nonfibrous stem material in such plants as flax, hemp, jute, ramie, and the like by first breaking the stem with opposing rollers or an S-shaped groove through which the plants are drawn. The stem is then clamped at either end, placed under tension, and caused to vibrate 1000 to 2000 times/minute by vibrating laths. This rapid vibration causes the fiber to throw off the nonfibrous material. A means is included in the machine for pounding and breaking roots which may adhere to the stem fiber. 13 figures. W.B.W.

MACHINERY—DRYERS

DUNGLER, JULIEN. Apparatus for continuously treating lengthy cellulose material. U. S. patent 2,641,850. Filed Feb. 7, 1950. Issued June 16, 1953. 1 claim. [Cl. 34-156]

Paper, cardboard, cellophane, and like web material in a wet condition from either a dyeing or printing operation is passed into a heated chamber in close contact with a set of nozzles from which heated air or steam is impinged on the wet surface. Channels are provided between the rows of nozzles for exhausting the drying fluid. 1 figure. W.B.W.

MACHINERY—FILTERS

BELL, ALBERT E. Filter unit construction. U. S. patent 2,642,187. Filed Jan. 11, 1950. Issued June 16, 1953. 4 claims. Assigned to Purolator Products, Inc. [Cl. 210-169]

Refill elements of resin-impregnated filter paper are fitted with end disks of the same material to seal the body of the filter. Thermoplastic cement is applied to the disks before bonding to the pleated body structure by the application of heat and pressure. The edges of these disks are turned down to define the edge of the filter element and to insure better bonding at the edge of the pleat. 4 figures. W.B.W.

LAYTE, RALPH R., and BELL, ALBERT E. Replaceable filter unit construction. U. S. patent 2,642,188. Filed Nov. 16, 1951. Issued June 16, 1953. 9 claims. Assigned to Purolator Products, Inc. [Cl. 210-169]

This is very similar to U. S. patent 2,642,187 (June 16, 1953) except that the bottom of the refill element is sealed around the outlet tube by an inwardly extending, completely annular rim with springy guide fingers to aid in centering the element. This eliminates the need for a sealing washer at the lower end of the filter. 3 figures. W.B.W.

MACHINERY—FOLDING MACHINE

LACH, JOHN. Folding machine for continuous strips of stationery. U. S. patent 2,643,878. Filed Aug. 14, 1950. Issued June 30, 1953. 6 claims. Assigned to Uarco Incorporated. [Cl. 270-39]

Strip forms divided by lines of weakening and interleaved with carbon

paper are aligned and folded into a zig-zag stack. Border perforations are engaged by spring-loaded pins to bring all elements into alignment. The zig-zag folded stationery is carried out of the machine on a conveyor. 12 figures. W.B.W.

TEALL, OLIVER E. Web interfolding apparatus and method. U. S. patent 2,642,279. Filed Feb. 21, 1950. Issued June 16, 1953. 18 claims. Assigned one-third to William Edds and one-third to Douglas Crutchley. [Cl. 270-40]

Sheet material in web form flows steadily from a series of supply rolls (which determine the number of interfolded sheets) through forming devices in a continuous operation. Interference during interfolding of the webs is claimed to be completely eliminated. 14 figures. W.B.W.

MACHINERY—LUMP-BREAKER ROLL

FASOLI, PAUL A. Lump breaker construction. U. S. patent 2,643,587. Filed July 1, 1950. Issued June 30, 1953. 1 claim. Assigned to The Sandy Hill Iron & Brass Works. [Cl. 92-47]

An idler roll is mounted above a driven roll for breaking lumps in a wet paper web. The pressure of the idler roll against the paper web may be adjusted as required. The construction is disclosed in connection with a suction roll, but may be used with other elements of the paper machine or the like. 3 figures. W.B.W.

MACHINERY—PACKAGING MACHINERY

BLANCHETTE, HILAIRE. Molding and wrapping machine. Canadian patent 493,437. Filed Nov. 12, 1949. Issued June 9, 1953. 15 claims.

This machine molds butter in the semiplastic state into rectangular blocks of predetermined weight and size and wraps the individual blocks with paper. 41 figures. W.B.W.

BROOK, LEONARD. Wrapping machine. U. S. patent 2,643,500. Filed April 21, 1952. Issued June 30, 1953. 5 claims. Assigned to The Forgrove Machinery Company Limited. [Cl. 53-126]

A wrapping machine for bunch or twist wrapping of confectionery and similar articles is claimed. 3 figures. W.B.W.

CAMPBELL, SAMUEL J. Wrapping machines. Canadian patent 493,772. Filed Aug. 21, 1946. Issued June 23, 1953. 31 claims.

A machine is adapted for the packaging of individual candy bars in wrappers severed from webs of sheet material. This is the same as U. S. patent 2,602,276 (July 8, 1952); *cf.* B.I.P.C. 22: 962. 19 figures. W.B.W.

CLOUD, WILLIAM S. Enclosing articles in tubular wrappers. U. S. patent 2,643,496. Filed March 15, 1947. Issued June 30, 1953. 5 claims. [Cl. 53-89]

A packaging machine is claimed which cuts wrapper lengths (for candy bars, etc.) from a tube, applies glue to one end of the tube and seals it, blows the tops open for either manual or automatic insertion of the product, and applies adhesive to the other end and seals it. 21 figures. W.B.W.

ELSAESSER, FRANK S. Sheet transfer means. U. S. patent 2,643,880. Filed Nov. 14, 1947. Issued June 30, 1953. 8 claims. [Cl. 271-42]

Precut sheets of paper of suitable quality are removed from a stack, and a quantity of ground meat is placed on the paper. The sheet is then folded over and the meat pressed into a patty by passing between confining belts. The patty is protected by the paper wrapping until ready for cooking. 12 figures. W.B.W.

GERLACH, CARL A. Wrapping machine. U. S. patent 2,643,499. Filed Aug. 11, 1949. Issued June 30, 1953. 5 claims. [Cl. 53-102]

A rotary conveyor carries large cylindrical paper rolls successively through one wrapper-applying and tucking stations. A rim of glue is applied over the tucked ends and two circular pieces of paper or end caps are thrust against the glued surfaces. Approximately 10 rolls/minute can be wrapped by the machine which requires little floor space. 7 figures. W.B.W.

HOHL, GEORGE I., RIST, JOHN M., WEISE, FREDERICK H., and RIST, GOTTLEIB A. Wrapping machine. Canadian patent 493,909. Filed June 29, 1949. Issued June 23, 1953. 19 claims. Assigned to Processing Equipment Corporation.

A high-speed, continuous wrapping machine is designed for packaging candy or tablets with cellophane or waxed paper. This is the same as U. S. patent 2,592,283 (April 8, 1952); *cf.* B.I.P.C. 22: 712. 16 figures. W.B.W.

KERR, CHARLES E., and ELSHEIMER, ROSCOE. Carton handling machine. Canadian patent 493,681. Filed May 9, 1949. Issued June 16, 1953. 17 claims. Assigned to Food Machinery and Chemical Corporation.

This machine erects and opens one-piece cartons, then fills, closes, and seals them. This is the same as U. S. patent 2,577,529 (Dec. 4, 1951); *cf.* B.I.P.C. 22: 375. 53 figures. W.B.W.

RICHARD, CHARLES F. Bag packaging machine. U. S. patent 2,641,882. Filed Dec. 2, 1949. Issued June 16, 1953. 15 claims. Assigned to Niagara Packaging Machinery Corporation. [Cl. 53-144]

This machine fills, folds the flap, and seals bags made of flexible material such as cellophane or paper. Sealing is accomplished by a number of means, depending on the bag material and the contents. The flap may be heat sealed, stapled, crimped, etc. 42 figures. W.B.W.

SANDBERG, OSCAR. Package wrapping machine. U. S. patent 2,642,707. Filed Jan. 29, 1949. Issued June 23, 1953. 22 claims. Assigned to Lynch Corporation. [Cl. 53-42]

A machine for wrapping four or five sandwiches made from cookies or crackers in heat-sealable material is claimed. A heating element in the machine seals the ends and side overlap of the wrapping. 35 figures. W.B.W.

WOELFER, ROBERT O. Carton opening, filling, and closing mecha-

nism. U. S. patent 2,643,497. Filed Oct. 8, 1949. Issued June 30, 1953. 19 claims. [Cl. 53-91]

The machine claimed removes the flat blank from the hopper, sets up the carton, and opens the flaps by means of rails which engage the flaps and hold them open while the filling operation is in progress. The flaps are closed by the same means and held in the closed position until the adhesive has set. 23 figures. W.B.W.

MACHINERY—PASTING MACHINE

STECKLING, CHARLES W. Carton taping apparatus and method. U. S. patent 2,643,016. Filed Nov. 18, 1949. Issued June 23, 1953. 14 claims. Assigned to Jos. Schlitz Brewing Company. [Cl. 216-22]

A machine for applying a strip of adhesive-coated tape over the closing-flap meeting line on the top of the carton is claimed. The tape is rolled to establish the adhesive bond, then cut so that the ends extend only a short distance down the side of the carton. Cartons sealed in this manner are easily opened without damage to the carton. 9 figures. W.B.W.

MACHINERY—PRESSES

CHAPMAN, RALPH. Fiberboard forming press with loader and unloader. U. S. patent 2,642,782. Filed April 10, 1948. Issued June 23, 1953. 2 claims. Assigned to Chapman Forest Utilization, Inc. [Cl. 92-61]

A multiple-unit loader and unloader for a board press embodies a series of screens upon which the wet board is transported into the press and which carry the finished board out at the opposite side of the press. Heated platens oppose the screens to provide a smooth surface for one side of the board. The wet mats are stored in an accumulator prior to pressing and are fed from the accumulator onto the screens of the press. 9 figures. W.B.W.

MACHINERY—PULPERS

WANDEL, KURT. Apparatus for effecting disintegration of materials. U. S. patent 2,641,165. Filed Oct. 14, 1949. Issued June 9, 1953. 4 claims. [Cl. 92-26]

Two or more saucer-shaped impellers are mounted on opposing walls of a vat containing aqueous suspensions of fibers of animal or vegetable origin. A marginal portion of each impeller disk is coated with an abrasive material over which the pulp is carried by centrifugal force generated by the rapidly revolving disk. Effective disintegration with a low power consumption is achieved with this apparatus (trade name DynoPulper). It has been found particularly useful in the pulping of waste paper. 10 figures. W.B.W.

MACHINERY—REFINERS

CROAKE, WILLIAM D., and ELLIS, BILLIE D. Paper machinery. U. S. patent 2,642,781. Filed June 12, 1951. Issued June 23, 1953. 8 claims. Assigned to The Black-Clawson Company. [Cl. 92-27]

A controlling device for jordans, attrition mills, and the like automatically prevents overtravel of the refining elements as they are moved apart at the conclusion of a refining operation. Overloading of the refiner motors is thereby prevented and, at the same time, the elements are in position to

resume refining without requiring adjustment by the operator. 13 figures. W.B.W.

MACHINERY—SCREENS

COLVIN, JULIUS J. Screen apparatus. U. S. patent 2,643,586. Filed May 16, 1951. Issued June 30, 1953. 4 claims. [Cl. 92-31]

A method of clamping the plates in a vibrating flat screen whereby the plate is readily releasable is claimed. 5 figures. W.B.W.

ROWE, CARL H., and MOKROS, ELMER R. Method and apparatus for the continuous screening of fluids. U. S. patent 2,631,733. Filed Oct. 9, 1947. Issued March 17, 1953. 9 claims. Assigned to K-C-M Company. [Cl. 210-198]

A finely woven wire mesh is used to screen undesirable material from paper-coating mixtures. The high viscosity of these suspensions makes it necessary to force them through the screen; this is done at the nip where the screen passes over rolls in the device. Doctor blades remove the material from the outside of the screen. 8 figures. W.B.W.

MACHINERY—SHEET STACKERS

BACKHOUSE, HEADLEY T. Sheet feeding apparatus. U. S. patent 2,643,121. Filed Nov. 9, 1949. Issued June 23, 1953. 4 claims. [Cl. 271-50]

A suction roller imparts the final movement to the sheet as it is advanced against the stops in the lay board. The amount of force applied by this roller is adjusted by raising the roller until the sheet is just brought up against the stops. This insures perfect registration of all sheets on two edges before delivery to a printing press or the like. 3 figures. W.B.W.

SPERLING, ARTHUR F., and SCHROEDER, WILLIAM E. Apparatus for cutting and stacking sheets. U. S. patent 2,641,974. Filed Aug. 5, 1949. Issued June 16, 1953. 14 claims. Assigned to Samuel M. Langston Co. [Cl. 93-93]

The principal feature of this device is a pusher mounted on an endless belt which removes a predetermined number of sheets of corrugated board from the bottom of the stack. While the sheets are delivered continuously to the top of the stack, the pusher operates intermittently to remove the desired number of sheets from the bottom and deliver them to a conveyor. The pile drops behind the pusher and is held in position by a spring-loaded device until a new stack of sheets is formed whereupon the pusher is again activated. 6 figures. W.B.W.

MACHINERY—SLITTERS AND WINDERS

SCHNEIDER, MAX. Web-slitting machine with minutely variable cutting-roll equipment. U. S. patent 2,643,719. Filed April 20, 1950. Issued June 30, 1953. 12 claims. [Cl. 164-70]

Cutting sleeves with a limited number of grooves against which the slitting wheel operates are claimed; each group of cutting grooves on a single cutting sleeve is arranged in an unsymmetrical manner to provide a more closely graduated series of cutting edges when a series of cutting sleeves with or without spacing sleeves is used. The grooved sleeves are separated on

the shaft by split spacing rings of equal width. A slide rule is provided which is so constructed that any combination of widths may be set quickly and accurately with the spacing rings and grooved sleeves. 8 figures.
W.B.W.

MACHINERY—WEB-FEEDING MECHANISM

FRISBIE, STEWART E., SMILEY, WILLIAM O., and FROMMER, JOSEPH C. Automatic control system. U. S. patent 2,643,117. Filed Aug. 29, 1949. Issued June 23, 1953. 3 claims. Assigned to Electric Eye Equipment Company. [Cl. 271-2.6]

A pair of photoelectric cell detecting devices actuate a means for alignment of the paper reel for feed into a printing press or the like. One detector is mounted near the reel and the second adjacent to the first impression roll of the press. Impulses from the two scanners are fed into an evaluator which actuates the alignment device. Inspection of the web position is on a timed-interval basis to eliminate hunting by the system. 7 figures.
W.B.W.

MOLDED PULP ARTICLES

RANDALL, WALTER H. Pack for fruit and other articles. Canadian patent 493,370. Filed March 8, 1951. Issued June 2, 1953. 12 claims. Assigned to Keyes Fibre Company.

A molded pulp pack for fruit and like articles is formed by two elongated trays hinged together at one edge. The rounded end sections allow closure to a predetermined point so that an opening for inspection of the contents remains along one side. Elastic bands may be used to hold the pack in closed position, or the pack may be overwrapped with cellophane or like material to prevent the entrance of dirt. 15 figures. W.B.W.

SHEPARD, ERNEST L. Materials for packing tubes and the like. Canadian patent 493,371. Filed March 19, 1951. Issued June 2, 1953. 4 claims. Assigned to Keyes Fibre Company.

Accordion-pleated molded pulp separators are used for packing fragile tubular items in shipping cartons. In packing a carton, the layers are staggered so that the ridges of the lower layer interlock with the separator immediately above to form a frictionally-bound unit. Several such separators are spaced along the length of the carton to provide support as needed by the article. 5 figures. W.B.W.

PACKAGING

STENSGAARD, WILLIAM L. Display package for neckties. Canadian patent 493,923. Filed July 14, 1952. Issued June 23, 1953. 1 claim. Assigned to W. L. Stensgaard and Associates, Inc.

A number of neckties are held on accordion-folded panels of a single-piece cardboard package. The outer covering of the package is formed by interlocking flaps which fold around the display panels. 11 figures. W.B.W.

VINES, OSCAR L. Carton. U. S. patent 2,643,813. Filed Aug. 24, 1951. Issued June 30, 1953. 5 claims. Assigned to Alford Cartons. [Cl. 229-31]

An elongated tray for packaging fruit such as tomatoes is made by folding

a paperboard blank along fold lines established in the blank. The filled tray is subsequently wrapped with a transparent material which leaves the contents exposed to view. 7 figures. W.B.W.

WILLIAMS, MICHAEL P. Protecting wrapper for automobile doors. U. S. patent 2,643,050. Filed March 20, 1951. Issued June 23, 1953. 8 claims. Assigned to Cadillac Products, Inc. [Cl. 229-87]

A procedure for wrapping irregularly shaped objects, such as automobile doors, is described. Creped kraft paper is used as an over-all wrapper to protect the surface, and a flattened paper tube filled with padding material, such as excelsior, etc., is used to cover the edges. A laminated assembly of alternate corrugated and flat cardboard strips is fastened to the bottom of the door for protection when stacked in a vertical position. 6 figures. W.B.W.

PACKAGING—OPENERS

BARTELT, HAROLD L. Quick opening bag. U. S. patent 2,643,049. Filed Sept. 11, 1951. Issued June 23, 1953. 7 claims. [Cl. 229-62]

A sealing strip is applied across the opening of a bag of cellophane, Pliofilm, or other heat-sealable material. One wall of the bag is shorter than the other so that the seal strip engages the inside of the long wall and the outside of the short wall. The seal strip is coated with a microcrystalline wax or the like to make it easily removable. 5 figures. W.B.W.

PAPER—COATED

FAEBER, HARRY W. Single coating machine. Canadian patent 494,120. Filed Sept. 28, 1948. Issued June 30, 1953. 19 claims. Assigned to Time, Incorporated.

A coating fountain, several distributor rolls, and an applicator roll are so arranged that one or more of the rolls may be easily disengaged in the event of a break in the web. Means are provided so that the rolls may be returned to the original setting without readjustment. 17 figures. W.B.W.

RALSTON, ANDERSON W., VANDER WAL, ROBERT J., and HARWOOD, JAMES. Polyamides. U. S. patent 2,617,813. Filed May 13, 1944. Issued Nov. 11, 1952. 9 claims. Assigned to Armour and Company. [Cl. 260-404.5]

The condensation of polymerized unsaturated aliphatic amines of at least 18 carbon atoms with polymerized unsaturated fatty acids of at least 18 carbon atoms produces flexible elastic polymers suitable for coating paper, textiles, and metal products. W.B.W.

PAPER SPECIALTIES

ATKINSON, RALPH L. Sanitary napkin. U. S. patent 2,643,656. Filed Oct. 31, 1950. Issued June 30, 1953. 9 claims. Assigned to Personal Products Corporation. [Cl. 128-290]

A center layer of tissue wadding has, superposed on each face, an individually wrapped fluff layer with a fluid-repellent tissue on one face of the tissue wadding layer. The edges of the three layers are covered with fluid-repellent tissue to prevent penetration of the fluid through the edges of the pad. 3 figures. W.B.W.

BAYNES, WILLIAM C. Greeting card and envelope assembly. U. S. patent 2,642,182. Filed Oct. 23, 1947. Issued June 16, 1953. 2 claims. [Cl. 206-63]

An adhesive-coated tab serves the two-fold purpose of price tag and holder for a greeting card and its envelope for counter display. 24 figures. W.B.W.

FOSS, CARL W., and BUELL, HALSEY W. Waterproof sandpaper and backing therefor. U. S. patent 2,642,349. Filed Feb. 4, 1950. Issued June 16, 1953. 16 claims. Assigned to The Carborundum Company. [Cl. 51-295]

A wet-strength paper is further treated with a varnish made up of maleic anhydride, castor oil, and glycerine to form a suitable backing for abrasive sheets. Sheets so treated become flexible upon soaking and remain so for some time. W.B.W.

LONGTIN, GEORGE L. R. Snow fencing. U. S. patent 2,632,481. Filed March 10, 1950. Issued March 24, 1953. 2 claims. Assigned to Kraft Paper Products Limited. [Cl. 139-425]

Twisted paper strands are woven into an open mesh fencing with a wire strand near the top to prevent sagging. 6 figures. W.B.W.

TONE, FRANK J., and MARTIN, HARRY C. Coated abrasive article and the method of making the same. U. S. patent 2,595,733. Filed May 13, 1936. Issued May 6, 1952. 9 claims. Assigned to The Carborundum Company. [Cl. 51-298]

A heat-hardenable phenolic resin is used to apply a coating to the abrasive particles and the surface of the flexible disk which may be spring steel, paper, or fabric. The abrasive particles are scattered over the surface of the treated disk, and sufficient heat is applied to cure the bond. 4 figures. W.B.W.

WACHTER, AARON, and STILLMAN, NATHAN. Compositions for protection of metals against corrosion. U. S. patent 2,643,176. Filed Oct. 28, 1946. Issued June 23, 1953. 10 claims. Assigned to Shell Development Company. [Cl. 21-2.5]

Kraft paper and paper laminates with the less pervious layer on the outside have been found, among other substances, to provide a suitable means of supplying the vapor-phase inhibitor (organic nitrogen-base nitrite salts) to the atmosphere surrounding the metal parts. Waxed paper, on one side of which was sprinkled the powdered or crystalline inhibitor while the wax was in a softened condition, was also found to be an effective supplier of corrosion-inhibiting vapors. W.B.W.

WACHTER, AARON, and STILLMAN, NATHAN. Corrosion inhibition. U. S. patent 2,643,178. Filed April 19, 1946. Issued June 23, 1953. 15 claims. Assigned to Shell Development Company. [Cl. 21-2.5]

This is similar to U. S. patents 2,643,176 and 2,643,177. W.B.W.

WACHTER, AARON, and STILLMAN, NATHAN. Vapor phase cor-

rosion inhibition of metals. U. S. patent 2,643,177. Filed May 7, 1946. Issued June 23, 1953. 12 claims. Assigned to Shell Development Company. [Cl. 21-2.5]

This is very similar to U. S. patent 2,643,176. W.B.W.

PURIFIED WOOD FIBER

MARTIN, MERVIN E., and SHERK, DANIEL L. Purification of cellulosic materials. Canadian patent 493,657. Filed Feb. 1, 1950. Issued June 16, 1953. 4 claims. Assigned to Celanese Corporation of America.

A sulfite pulp is subjected to an initial alkali cook (which may optionally be omitted), then chlorinated, and given another alkali cook at a temperature above 160°C. The pulp is also bleached at some point in the process. It is claimed that the second cook serves to reduce materially the pentosan content of the pulp. This is the same as U. S. patent 2,558,054 (June 26, 1951); *cf.* B.I.P.C. 21: 901. 1 figure. W.B.W.

SHIPPING CONTAINERS

BELSINGER, JACK R. Easy packing shipping container of large capacity. Canadian patent 493,323. Filed March 27, 1951. Issued June 2, 1953. 1 claim. Assigned to Belsinger, Inc.

A deep easily packed shipping container comprises a lower body section, a lower liner section which terminates a substantial distance below the edge of the lower body section, an upper liner section which telescopes into the lower body section and rests upon the lower liner section, and an upper body section which telescopes over the upper liner section and abuts the upper edge of the lower body section. The lower section (with the liner in place) is packed, then the upper liner is inserted and packing continued to the top of the liner. 6 figures. W.B.W.

FLEMING, HUGH P. Chick box. U. S. patent 2,643,810. Filed Sept. 13, 1949. Issued June 30, 1953. 1 claim. Assigned to Fleming Specialty Company. [Cl. 229-15]

A perforated corrugated container is fitted with transverse partitions, the end portion of which extends above the side walls. The end portions extend through the slots in the perforated lid and act as spacers to allow ventilation when the boxes are stacked. 6 figures. W.B.W.

LANGE, FÈRDINAND. Box construction. U. S. patent 2,643,812. Filed July 24, 1950. Issued June 30, 1953. 4 claims. Assigned to Werner Bahlsen. [Cl. 229-31]

The corners of this open-top box are formed by making at least three pleats at the corner instead of the usual single triangular pleat. By folding successive pleats against adjacent walls, the corner is stiffened and, at the same time, forms a shoulder for the support of a liner or lid. The box can be sealed to be substantially dampproof and prevent the escape of aromas; it withstands the strains of packing and shipping. 11 figures. W.B.W.

SHIPPING CONTAINERS—FIBER DRUMS

CARPENTER, HERBERT L. Method of making fiber drums having

metal closures. U. S. patent 2,641,827. Filed June 16, 1949. Issued June 16, 1953. 2 claims. Assigned to Carpenter Container Corporation. [Cl. 29-148.2]

The attachment of the metal head to the tubular fiber body of the drum is accomplished by spinning tools that crimp the fiber material and the metal into a rolled bead. This does not weaken the drum wall at the point of attachment. 12 figures. W.B.W.

LENARD, FREDERICK P., and METHVEN, GEOFFREY W. Method of producing multiply metal-foil-cardboard material and of producing articles formed of such material. U. S. patent 2,643,593. Filed Oct. 30, 1948. Issued June 30, 1953. 8 claims. Assigned to The New Merton Board Mills Limited. [Cl. 93-55.1]

A metal foil is adhesively joined to cardboard with a liquid-soluble adhesive which is convertible to a water-insoluble adhesive by treatment with formaldehyde. Two or more layers of the composite web are bonded together by a thermosetting adhesive which contains an excess of formaldehyde. Heating of the bonded laminate liberates formaldehyde which penetrates the cardboard and renders the liquid-soluble adhesive insoluble. Multi-ply drums with metal ends and a vacuum-sealable opening, formed from this laminated material, are useful for vacuum packing of food. 5 figures. W.B.W.

SHIPPING CONTAINERS—MULTIWALL BAGS

WILSON, IVAN V. Paper container with slip resistant coating. U. S. patent 2,643,048. Filed Sept. 20, 1947. Issued June 23, 1953. 7 claims. Assigned to Monsanto Chemical Company. [Cl. 229-53]

The outer layer of multiwall paper bags or other packaging containers is treated with colloidal silica to provide slip-resistant surfaces. 2 figures. W.B.W.

TALL OIL

BERETVAS, HELEN S. Method of sulfurizing esters. U. S. patent 2,644,810. Filed June 29, 1949. Issued July 7, 1953. 20 claims. Assigned to Standard Oil Company. [Cl. 260-97.5]

Unsaturated aliphatic acids, such as tall oil, are esterified using an excess of oleyl alcohol with sulfuric acid as a catalyst and petroleum naphtha as a solvent. The ester formed is sulfurized at a temperature of 122 to 175°F. with about 30% sulfur chloride and 10% water. The reaction mixture is neutralized with sodium carbonate, then taken up in hexane, and the hexane solution separated from the insoluble material. W.B.W.

WASTE LIQUOR

NILSSON, NILS E. Device for recovering the inorganic content of waste liquor. Canadian patent 493,617. Filed June 7, 1947. Issued June 16, 1953. 2 claims.

In a process for the recovery of inorganic material from spent cooking liquor, after initial concentration, the liquor is introduced through an injector nozzle together with primary air into a combustion chamber, in the form of a cloud or spray of fine particles. The larger particles begin to boil in the flame shell formed at the mouth of the injector nozzle, whereas the incompletely burned combustion gases are burned completely with secondary air

which is introduced through another set of stationary nozzles. The inorganic content of the liquor is collected in smelted condition on the sloping bottom of the chamber and drawn off through a spout. This is the same as U. S. patent 2,591,188 (April 1, 1952); *cf.* B.I.P.C. *22*: 720-1. 7 figures.
W.B.W.

WOOD—EXTRACTIVES

JENSEN, LLOYD B., and MILLER, WILLIAM A. Food preservative from white cedar. Canadian patent 494,113. Filed April 7, 1949. Issued June 30, 1953. 6 claims. Assigned to Swift & Company.

By extracting white cedar wood (*Thuja occidentalis*) with a suitable solvent, (e.g., acetone) extractives (I) were obtained which inhibited the growth of certain pathogenic bacteria causing food poisoning and sporlap. The extract kills *Staphylococcus aureus, Achromobacter perolens,* and *Penicillium camemberti* in dilutions of 1:100 and *Bacillus niger* and *Clostridium sporogenes* in dilutions as high as 1:500. 2 tables. L.E.W.

JENSEN, LLOYD B., and SHERMAN, JOSEPH E. Food preservative from butternut tree. Canadian patent 494,112. Filed March 7, 1949. Issued June 30, 1953. 6 claims. Assigned to Swift & Company.

The bark of butternut rootwood (*Juglans cinerea*) when extracted with a suitable solvent (like acetone) furnished extractives which served as food preservatives against pathogenic organisms. The butternut bark antibiotic kills *Staphylococcus, Bacillus niger,* and *Clostridium sporogenes* in dilutions of 1:1000 and *Salmonella typhimurium* and *Escherichia coli* in dilutions of 1:100 for limited periods of time. 2 tables. L.E.W.

WOOD TRANSPORTATION

WAHL, HAROLD F. Apparatus for the transportation of pulpwood and the like. U. S. patent 2,643,012. Filed May 23, 1950. Issued June 23, 1953. 4 claims. Assigned to Hyster Company. [Cl. 214-85.1]

A logging arch is slightly modified by the addition of a slanting apron against which the load may rest. Loads of pulpwood are transported by first binding the load with a cable sling, then lifting it into carrying position on the arch with the tractor winch. A quick-release device on the cable sling facilitates unloading. 18 figures. W.B.W.

The Institute of Paper Chemistry has entered into an agreement with University Microfilms, Ann Arbor, Michigan, whereby University Microfilms is authorized to provide microfilm copies of this Bulletin to subscribers. To the extent that back issues were in print at the date of execution of the agreement, microfilm copies of these back issues can also be obtained. Sales by University Microfilms of films of this Bulletin are restricted to regular subscribers to the Bulletin. The microfilm is distributed only at the end of the volume year. The film is in the form of positive microfilm, and is furnished on metal reels, suitably labeled. Inquiries concerning purchase should be directed to:

University Microfilms
313 North First Street
Ann Arbor, Michigan

LIBRARY SERVICE

The Library of The Institute of Paper Chemistry is located in the Kimberly Memorial Building. Its purpose is to serve the students and the faculty of The Institute of Paper Chemistry and the chemists and technologists of the pulp and paper industry.

To contributing members it gives the following service:

A monthly bulletin is issued, listing all new books and periodicals added to the library and containing titles and abstracts of articles published during the previous month in the field of pulp and paper chemistry and technology. The annual index carries a list of periodicals currently received.

At a reasonable cost the librarian will furnish complete reference lists on chemical and technical problems for member mills, and will procure translations, photostats, or abstracts of the articles listed. Upon request, member mills working on special problems will be kept in touch with new publications related to their work.

Reviews of new publications pertaining to the field of pulp and papermaking will be included from time to time.

The library is open daily with the exception of Sundays from 8 a.m.-5 p.m. and from 7:30-9:30 p.m. Saturday it closes at 5 p.m.